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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Some Observations on Peptic Ulcer. By DANIEL T. DAVIES, F.R.C.P.—(*Illustrated*)—(*To be concluded*) 521

The Rôle of the Toxin in Staphylococcal Infection. By F. C. O. VALENTINE, M.R.C.P. 526

Operation for Femoral Hernia by a Midline Extraperitoneal Approach. By Prof. A. K. HENRY, F.R.C.S.—(*Illustrated*) 531

Temporary Paralysis of the Diaphragm in the Treatment of Pulmonary Tuberculosis. By L. O'SHAUGHNESSY, F.R.C.S., and J. H. CRAWFORD, M.B.—(*Illustrated*) 534

Accidental Transmission of Malaria by Blood Transfusion. By W. L. THOMAS, F.R.C.S., and S. KEYS, M.R.C.S. *With Note by* S. C. DYKE, F.R.C.P. 536

CLINICAL AND LABORATORY NOTES

Technique of Varicose Vein Injections. By M. J. BENNETT-JONES, F.R.C.S. 537

Rupture of Uterus without Symptoms. By J. H. K. STEVENS, M.R.C.P. 538

Spontaneous Subluxation of the Atlanto-axial Joint. By J. T. CHESTERMAN, F.R.C.S.—(*Illustrated*) 539

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Medicine: Obliterative Arterial Disease 540

Section of Urology: Horseshoe Kidney—Surgical Treatment of Impotence 541

Medico-Legal Society: Statutory Safeguards against Poisoning 543

Society of Medical Officers of Health: Prevention of Maternal Mortality. 545

Liverpool Medical Institution: Bacteriological Aspects of Puerperal Sepsis 547

Midland Medical Society. 548

Pathological Society of Manchester 549

REVIEWS AND NOTICES OF BOOKS

Localized Rarefying Conditions of Bone. By E. S. J. King, F.R.C.S... 549

Bacteriology of Typhoid. By L. C. Havens, M.D... 550

An Index of Treatment. Edited by R. Hutchison, F.R.C.P. 550

Thorpe's Dictionary of Applied Chemistry. By Prof. J. F. Thorpe, D.Sc., F.R.S., and M. A. Whiteley, D.Sc. 550

Chronic Streptococcal Toxæmia and Rheumatism. By J. D. Hindley-Smith, M.R.C.S. 550

The Anti-Drug Campaign. By S. H. Bailey 551

A Short Ante- and Post-Natal Handbook. By R. Kelson Ford, M.D... 551

Urology in Women. By E. Catherine Lewis, F.R.C.S. 552

Glandular Physiology and Therapy 552

LEADING ARTICLES

MESCALINE IN PSYCHIATRIC RESEARCH 553

HEAT REGULATION AND FEVER 554

ACUTE NICOTINE POISONING 555

PENAL CASES IN CAMERA BEFORE THE G.M.C. 556

ANNOTATIONS

Weight-loss and Post-operative Mortality in Gastric Surgery 557

Medical Opuscules 557

Narcosis in Animals and Man 557

Functions of the Pineal ... 558

Research in Tropical Medicine 558

Non-specific Immunity of the Peritoneum 558

A New International Conference on Dangerous Drugs 559

Twin Coroners? 559

Charles Nicolle 560

Measurements of Red Cell Size 560

Fog and Filthy Air 561

Early Diagnosis of Pulmonary Tuberculosis ... 561

PROGNOSIS

XCI.—Prognosis in Spinal Caries. By Sir HENRY GAUVAIN, M.D. 562

SPECIAL ARTICLES

Ivan Petrovitch Pavlov—(*With portrait*) 564

The Red Cross as Sanctuary 552

Medicine and the Law: The Nottingham Nursing-home Trial 566

The Irish Hospitals: Conditions in Dublin 567

Scotland: The Corpus Luteum and Pregnancy. 568

Paris: The New French Academy of Surgery 569

Fothergill Testimonial Fund 577

Infectious Disease in England and Wales 581

CORRESPONDENCE

Intranasal Submucous Injections of Calcium (Prof. R. Bárány) 570

"A Doubtful Case of Typhus Fever" (Dr. A. H. Skinner) 570

Treatment of Vaginal Discharge (Mr. Keith Duff, F.R.C.S.) 571

"Near" X ray Therapy (Dr. Douglas Webster).. 571

Alleged Negligence in Hypodermic Injection .. 571

Stammering (Mr. St. John Rumsey) 572

A Secondary Reaction After Anti-cholera Inoculation (Dr. M. Tewari) 572

An Address in Harley Street 572

Short-wave Therapy (Mr. H. J. Taylor, Ph.D.).... 573

THE SERVICES

Royal Naval Medical Service.—Army Medical Services.—Royal Army Medical Corps.—Royal Air Force.—Deaths in the Services 563

PANEL AND CONTRACT PRACTICE

Insulin for Seamen—"Special Skill and Experience"—Surgery Inspection 573

OBITUARY

James Brunton Blaikie, M.B. ..... —

Septimus Tristram Pruen, M.D. 574

Vincent Thomas Borthwick Yule, M.B. 574

PARLIAMENT

Notes on Current Topics: Milk and Nutrition Problem 575

House of Commons: Death Certifications and Vaccination—Public Health Legislation—Tuberculosis in Wales—Convictions for Murder—Small-pox Deaths—Mental Deficiency Research—School Dental Service 575

MEDICAL NEWS

University of Oxford 578

University of London 578

University of Dublin 578

British Postgraduate Medical School 578

New Ophthalmic Clinic.... 578

Epsom College 578

Institute of Psycho-Analysis 578

Catholic Medical Congress . 578

Hunterian Society 578

Fellowship of Medicine.... 578

NOTES, COMMENTS, AND ABSTRACTS

Poisons for Rodents 580

The Common Cold Again.. 580

Defence against Air Raids 580

Ministering Angels on Horseback 580

Guide to Income-tax Problems 581

New Preparations: "Iozo" White Stainless Iodised Ointment—Petein—A-B-D Capsules—Brom-Nervacit 581

Medical Diary 579

Appointments 582

Vacancies 582

Births, Marriages, Deaths 582

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ADDRESSES AND ORIGINAL ARTICLES

SOME OBSERVATIONS ON PEPTIC ULCER *

By Daniel T. Davies, M.D. Wales, F.R.C.P. Lond.
ASSISTANT PHYSICIAN TO THE ROYAL FREE HOSPITAL, LONDON

Peptic ulcer is in some respects a modern disorder, for it is unknown in the primitive uncivilised races, and equally unknown in the animal kingdom. It attacks the young adult rather than the old, the thin rather than the fat, and males more frequently than females. It is a common source of ill-health in city dwellers, and more often in those who carry responsibilities and their attendant anxieties. Moreover, there is a constitutional type which is prone to develop the disorder, the doer rather than the dreamer, the active in body and mind rather than the lethargic and more contented. It is not surprising, therefore, that its incidence is on the increase. The Registrar-General's statistics show that the number of deaths from ulcer has risen steadily during the past ten years (Table I.), and since the mortality is relatively low, we can assume that the number actually suffering from the disorder is also steadily rising.

TABLE I

Deaths due to Peptic Ulcer in England and Wales (1921–31)

—	1921.	1923.	1925.	1927.	1929.	1931.
Males ..	1693	2106	2454	2973	3053	3214
Females ..	963	906	998	997	1028	1021
Total ..	2656	3012	3452	3970	4081	4235

Experimental and Pathological Data

Before proceeding to the more clinical aspect of this problem, brief reference should be made to work which has been done on animals. For many years attempts to produce a "chronic" ulcer met with no success, but during recent years this has been accomplished, largely through the work of American experimental surgeons, notably Mann,[1] Ivy,[2] Matthews and Dragstedt,[3] and Morton.[4] Mann and Williamson [5] were the first to develop a technique of diverting the alkaline duodenal juices and demonstrate that an ulcer would form in the intestine distal to the anastomosis, although it appears that Exalto [6] in 1911 was the pioneer.

If the intestine is anastomosed to the stomach, and the duodenum with its alkaline juices allowed to drain into the lower part of the intestine, an ulcer readily forms at the site where the gastric juice first impinges on the intestinal mucosa. It develops with great rapidity, for according to Mann and Bollman [7] penetration of the mucosa only needs a few hours and perforation into the abdominal cavity can occur within the first 48 hours. The typical "chronic" ulcer forms within 3–4 weeks, and histologically this is identical with that seen in man. Furthermore, its presence, like that of the human ulcer, is heralded by such events as perforation or melæna.

Not only does this experimental ulcer form readily, but it equally readily disappears. Provided the acid juice is made to impinge on an adjoining part of the intestinal mucosa, the original ulcer begins to heal, and within 30 days healing is often complete. Mann draws attention to the delicacy of the repair tissue, and the ease with which it can be broken down again by coarse food or an acid juice. The mucosa readily regenerates, but if the muscle has been involved in the ulcerative process it is replaced by scar tissue only.

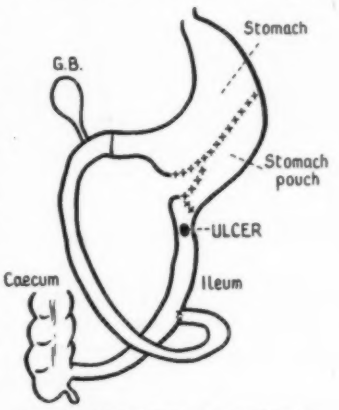


FIG. 1.—Matthews and Dragstedt's experiment.
G.B. = gall-bladder.

Matthews and Dragstedt's technique [3] is particularly instructive in demonstrating the essential action of the gastric juice (Fig. 1). By suturing the jejunum or ileum on to a gastric pouch, and thereby allowing the intestinal mucosa to be bathed with a highly concentrated acid juice, ulcers could be produced with regularity—"a striking example of the susceptibility of an organism's living tissues to the irritant action of its own pure active gastric juice." It was also demonstrated by these workers that if the gastric juice was deliberately retained in this pouch by plugging the stoma, an ulcer formed in the pouch itself. The implantation of a portion of intestinal wall into the stomach does not result in ulcer formation (Dragstedt and Vaughan [8]), but if a small gastric pouch is implanted into the intestine, ulcer formation is the rule. In the latter experiment the intestinal mucosa is exposed to the pure active juice undiluted with food, while in the former experiment the gastric juice is already diluted and buffered by food and saliva and its action weakened in consequence.

These experiments prove that under certain conditions normal gastric juice is by itself capable of producing a chronic ulcer in the intestine. The commonest seat of ulcer in man is the first part of the duodenum, and here, as Mann and Bollman state, "is the site where the onrushes of acidity produced in the fundus are met, diluted, neutralised and buffered for acceptance by the intestine." Under normal conditions the acidity of the duodenal contents fluctuates between a pH of 2 and 7, but the jejunal contents maintain a steadier reaction between a pH of 6·2 and 8·2 (Wu, quoted by Mann and Bollman [9]). When the jejunum is anastomosed to the stomach the jejunal contents are then found to fluctuate between a reaction of pH 1·7 and 8·33, under which condition we know that jejunal ulceration would be possible. Corroborative evidence of the importance of acid in ulcer development is the observation, again made by Mann, that repeated administration of acid does eventually result in an ulcer of the stomach itself.

Methods to produce partial pyloric stenosis have been shown to result in increased acidity,[10 11] and Bolton [12] in 1909 demonstrated the slow healing of traumatic ulcers under such conditions. Not only

* The Bradshaw lecture for 1935, delivered before the Royal College of Physicians of London on Nov. 5th.

does the acidity rise in partial pyloric stenosis, experimentally produced, but the spontaneous perforation of a duodenal ulcer has been recorded as a sequel to this (Elman and Eckert[13]; Hamburger and Friedman[14]). Elman and Eckert refer to the "inflammatory" reaction which occurs in the duodenum under such circumstances — a direct result of the increased acidity — a reaction which has its counterpart in the "duodenitis" described clinically as a precursor to ulcer.

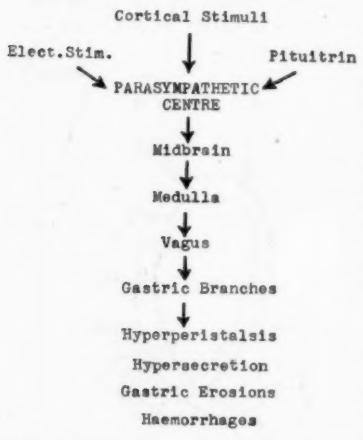


FIG. 2.—Diagrammatic representation of nervous pathways (after Cushing).

From these observations we are quite justified in concluding that the experimentally produced chronic peptic ulcer is dependent on an acid gastric juice for its development, and that an acid juice, provided it is undiluted, is sufficient for the development of the ulcer in the intestine. When we recall that the commonest seat of ulcer is in the duodenum, this knowledge derived from animal experiments becomes highly significant. We also learn that the ulcer forms with rapidity and likewise is rapid in healing. Whatever view is held regarding the ætiology of ulcer in man, due cognizance must be given to this eroding action of the gastric juice. Is it possible that clinical ulcers as readily heal and break down again? The coexistence of achlorhydria and ulcer would certainly be difficult to explain, and any treatment which does not allow for adequate neutralisation of the acid juice would not enjoy experimental support.

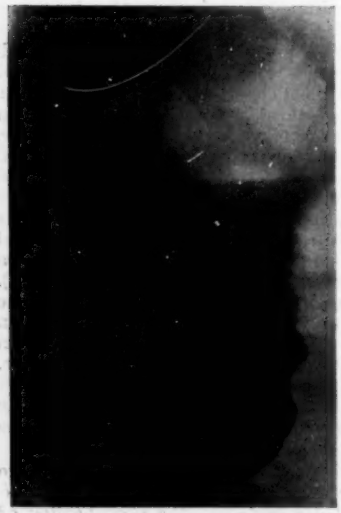


FIG. 4.—Large ulcer crater in a man of 64 with an eight weeks' history.

THE NERVOUS FACTOR

Some three years ago Harvey Cushing,[15] in a masterly article, referred to the influence of the nervous system on gastric function. Much that was valuable was resuscitated and further experimental work initiated.

That gastric changes can be caused by nervous lesions was first pointed out by Rokitansky[16] in 1846, and from then onwards isolated observations of organic brain lesions associated with gastric hæmorrhage and ulceration have been recorded. In 1875 Brown-Séquard[17] showed that injury to the base of the brain produced gastric erosions. The association of subtentorial hæmorrhage and brain injury at birth with gastric hæmorrhage was also noted and commented upon. Cushing's interest in the subject was aroused by the death of three patients from perforated ulcer after operation for a brain tumour. Some time before this Beattie[18] had shown that electrical stimulation of the nuclei in the region of the third ventricle leads to increased gastric peristalsis and hypersecretion; with continued stimulation gastric erosions could be produced. Severance of the vagi abolishes these effects, and identical effects are produced by direct stimulation of the vagus (McCrea, McSwiney, and Stopford,[19] 1927; Beattie and Sheehan,[20] 1934).

Stimulation of the brain-stem in any part, from this centre in the region of the third ventricle down along the vagal tracts to the vagal nucleus, will produce the same motor and secretory changes in the stomach (Fig. 2). Cushing recalls that this centre is in the vicinity of Cannon's seat of the emotions, and it must of course be influenced by higher centres. Is this pathway unduly stimulated under certain circumstances? For example, do emotional upsets result in hypersecretion and hyperperistalsis in the man who complains of epigastric discomfort under tension, and who ultimately develops an ulcer? Can we show in our clinical experience any such relationship between the nervous system and the production of a peptic ulcer? Is the onset of symptoms, either initially or in recurrences, related to some primary disturbance first experienced in the nervous system? If the nervous system plays a primary part in initiating symptoms, we should meet with such a group of symptoms before the development of the ulcer, and there should be a high incidence of emotional upsets in recurrences.

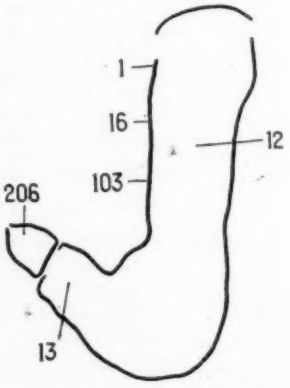


FIG. 3.—Diagram of stomach showing location of ulcers in author's series.

Scope of Present Inquiry

In this lecture I shall try to show that clinical experience is in many respects in accord with the experimental and pathological findings I have outlined. Do not clinical "ulcers" form readily and heal readily, and is there not good evidence to confirm the essential action of an acid gastric juice? Moreover, is there not an "ulcer" type in which symptoms frequently follow an emotional upset, and in which relaxation brings relief not only to the mind but also to gastric function?

During the last five years I have personally observed and followed 377 patients showing a "chronic" ulcer. They have been seen frequently, and periodic

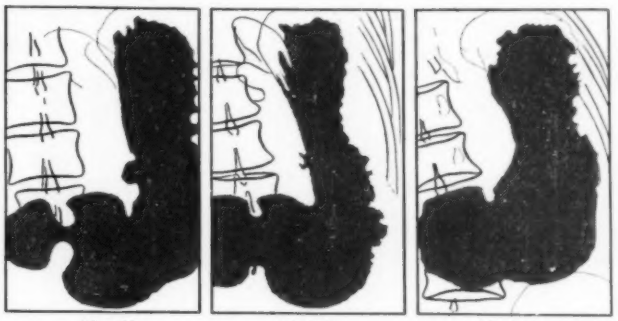
radiological examination has been carried out. The gastric secretion has also been repeatedly studied in a large number. The material is set out in Table II. :—

TABLE II

Cases under Review

		Male.	Female.
Gastric ulcers	145	75	70
Duodenal ulcers	206	137	69
Gastric and duodenal ulcers	11	6	5
Post-operative ulcers	15	14	1
	377	232	145

The proportion of females is somewhat high, and this is in all probability due to the preponderance of female patients at the Royal Free Hospital.

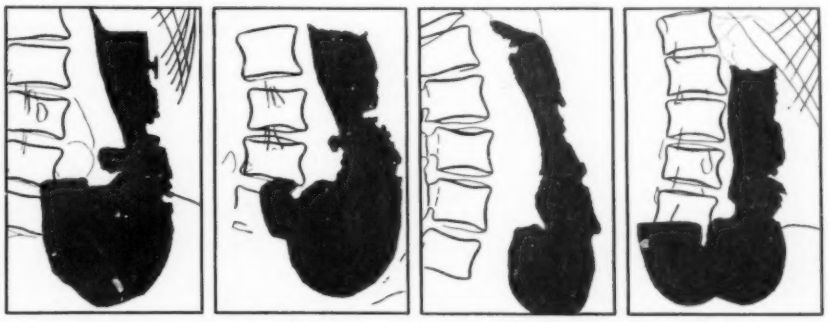


12.x.32 21.x.32 11.xi.32

FIG. 5.—A lesser-curve ulcer in a male aged 30. The second film shows the healing process a week later, with the disappearance of the crater at the end of a month in the third film. Ambulatory treatment.

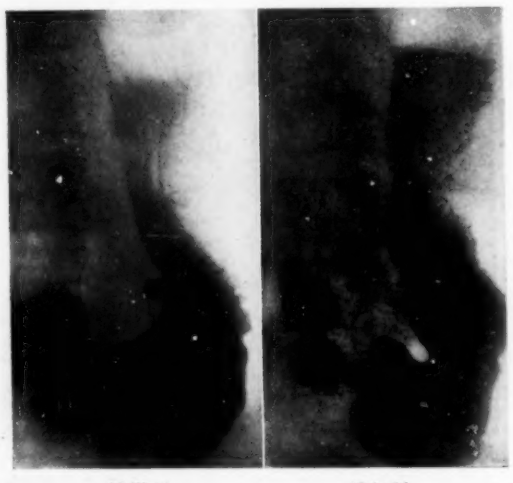
The Site of Ulceration

It is well established that the seat of the ordinary peptic ulcer is either in the first part of the duodenum or on the lesser curve of the stomach; it is seldom found in other parts of the stomach. In my series, as can be seen from Fig. 3, only 12 (3·4 per cent.) were on the posterior wall, and 13 (3·5 per cent.) in the prepyloric area. Of the 145 gastric ulcers 120 were on the lesser curve, and only 16 of these in the upper third; the middle third claiming 103. Only 1 was situated at the cardia. Those in the first part of the duodenum or on the lesser curve of the stomach amounted to 94 per cent. This distribution is important—as Hurst [21] has emphasised, and as Holmes and Hampton [22] have recently pointed out—in the differentiation between ulcer and cancer. Carcinoma of the stomach is usually a pyloric lesion, whereas only about 3 per cent. of benign ulcers are in the prepyloric area. It is well, therefore, to treat these prepyloric lesions as potential cancer, and, as Hurst maintains, operation on them is the wiser plan.



10.ii.33 27.ii.33 27.iii.33 24.v.33

FIG. 6.—A large lesser-curve ulcer in a woman of 42, who also showed an anæmia (Hb 40 per cent). Considerable diminution in size of crater is seen in 2¼ weeks, and no trace of abnormality could be demonstrated in 6 weeks. Note the improvement in gastric tone observed in the final film (3 months).



16.iii.34 27.iv.34

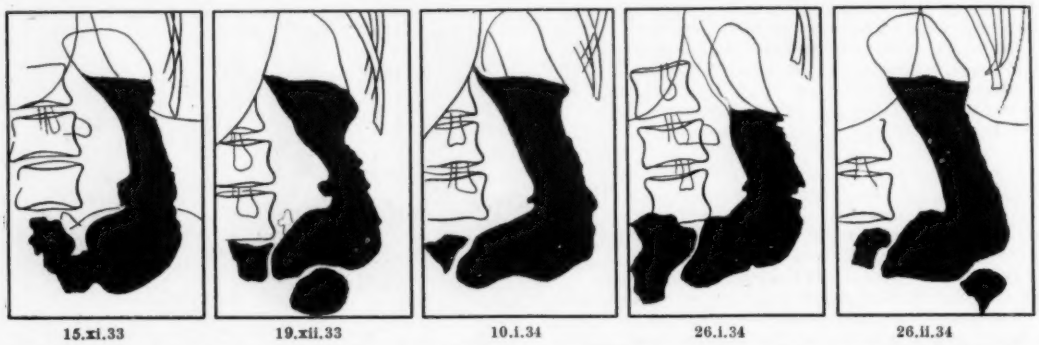
FIG. 7.—Ulcer of lesser curve in a woman aged 50, with complete disappearance in five weeks. Ambulatory treatment.

Rapidity of Formation of Ulcer

While histories of dyspepsia for ten years or more are common, some patients give only a history of a few weeks but nevertheless show a well-defined crater. The size of the ulcer crater is certainly not proportionate to the length of dyspepsia. Occasionally one has a chance of gauging the time of appearance of an ulcer, as in one of my patients, a man of 64, who had had dyspepsia for four weeks. A barium meal examination disclosed no ulcer crater; nor was anything abnormal seen at a second examination at the fifth week. At the eighth week, however, a large crater was plainly demonstrable (Fig. 4). In another case a large crater on the lesser curve was found in a man of 68 with only three weeks' dyspepsia.

Table III. shows the duration of symptoms in my series.

It will be seen that as many as 76 (23 per cent.) gave histories of less than three months' duration, and it is unlikely that in all these persons the ulcer



15.xi.33 19.xii.33 10.i.34 26.i.34 26.ii.34

FIG. 8.—A large lesser-curve ulcer in a woman aged 49, showing restitution to normal in 13 weeks. Ambulatory treatment.

crater preceded the symptoms. Remissions extend over a number of years, and the patient may enjoy freedom even without treatment for a considerable period. Unfortunately little is known of the radiological state in spontaneous remissions, but it is possible that a large number of ulcers do heal only to break down again in a recurrence.

TABLE III

Duration of Symptoms

—	Under 3 mths.	12 mths.	2 yrs.	4 yrs.	6 yrs.	6 yrs. +
Gastric ulcer	44	24	20	11	19	23
Duodenal ,,	32	38	26	31	24	55
Total ..	76	62	46	42	43	78

Much interest is being shown towards cases in which the patient has the symptoms of peptic ulcer, relieved by taking alkalis, yet no ulcer can be found. During the past five years I have collected 8 cases of this kind, in which barium meal examination was repeatedly negative over 2–4 years, but in which an ulcer crater eventually developed. While it would be true to say that these persons had suffered dyspepsia for a long period, the development of an actual ulcer was much more recent. For example, one of them, a woman of 33, had suffered periodic dyspepsia for ten years, and barium meals in 1931, 1932, and 1933 had disclosed no gastric or duodenal lesion; yet in 1935 a lesser curve ulcer became apparent.

The length of symptoms is therefore not necessarily an index of the chronicity of an ulcer. It may be that the actual ulcer crater develops in man more rapidly than we have been led to believe, and that it is not correct to regard the patient who has suffered from dyspepsia for ten years as having had an ulcer of the same duration. Is it not possible that the ulcer comes and goes, heals and breaks down again, instead of being a "chronic" indolent lesion persisting for years?

The Healing of the Ulcer Crater

From time to time much criticism has been levelled against the radiological interpretation of healing of the ulcer crater. It has been suggested that the size of the crater as seen radiographically is largely the result of surrounding œdema, and that medical measures merely dispel the swelling. There is some truth in this criticism; but on the other hand, a lesser curve ulcer can be fairly sharply outlined, and its diminution in size followed at frequent intervals without any difficulty until it disappears. Nicholas and Moncrieff showed the disappearance of the crater under treatment.[23] Symptoms are dispelled within a few days of adequate treatment, but I have been equally impressed with the rapidity with which repair proceeds and the crater diminishes in size. Considerable improvement is seen in 10–14 days, and in some favourable cases all trace of abnormality has disappeared in 28 days.

Of my lesser-curve ulcer patients 95 were followed sufficiently regularly to provide some information as to the time of ulcer disappearance (Table IV.).

TABLE IV

Time of Disappearance of Ulcer Crater (Lesser Curve)

Weeks 3	4	6	8	12	16	24
10 ..	16 ..	10 ..	23 ..	23 ..	6 ..	7

It can be seen that 82 were clear in three months and 59 in two months, and these figures gain significance from the fact that only a small minority—

24.viii.34 22.x.34

FIG. 9.—Ulcer of lesser curve, with an hour-glass stomach, in a woman of 55. Disappearance of ulcer crater in two months but persistence of the hour-glass deformity. Ambulatory treatment

18—received hospital treatment, the bulk being treated while still at their work. Individual examples of this rapid healing can be seen in Figs. 5–8. In addition to the disappearance of the crater, the gastric tone improves and the shape of the stomach becomes more normal.

A mechanical abnormality, in the form of an hour-glass stomach, is not a bar to the temporary healing of the crater, although such a mechanical defect should be corrected by surgical means without delay, even if it does not give rise to symptoms, for the ground is prepared for further ulceration and recurrences are likely (Fig. 9).

I am unable to demonstrate such significant changes in duodenal ulcer, for some deformity of the cap usually persists in all but the very small craters. There is, however, an obvious improvement in the films which initially show gastric delay and retention. An improvement in tone is observed, and this improvement may persist for years; the delay in emptying is corrected and the signs of early "pyloric stenosis" disappear. Indeed, the response to treatment is often astonishing as is illustrated by the following case:—

(A) 12.iv.33 (B) 2.vi.33 (C) 8.i.34

FIG. 10.—An ulcer crater on the lesser curve in a man aged 45. The first diagram does not indicate the real size of the crater, for its upper part was occupied by a large gas bubble. The second film shows a lessening in size of the crater in the sixth week. An acute appendicitis developed 8 weeks later, but no gastric lesion could be traced by the surgeon. The third film shows a return of the crater in 10 months' time. Ambulatory treatment.

A woman of 68 showed the radiographic appearances of early pyloric stenosis in 1932, in that there was gastric delay, a dilated stomach, and a duodenal deformity. Her weight was 8 st. I had intended, after a preliminary course of lavage and medical treatment, to advise a gastro-enterostomy, but her improvement was maintained, and it has so far been unnecessary to consider operation. The radiogram taken in 1935, three years later, shows a better tone, and the stomach now empties in normal time. Her weight has also increased from 8 st. to 11 st. 2 lb.

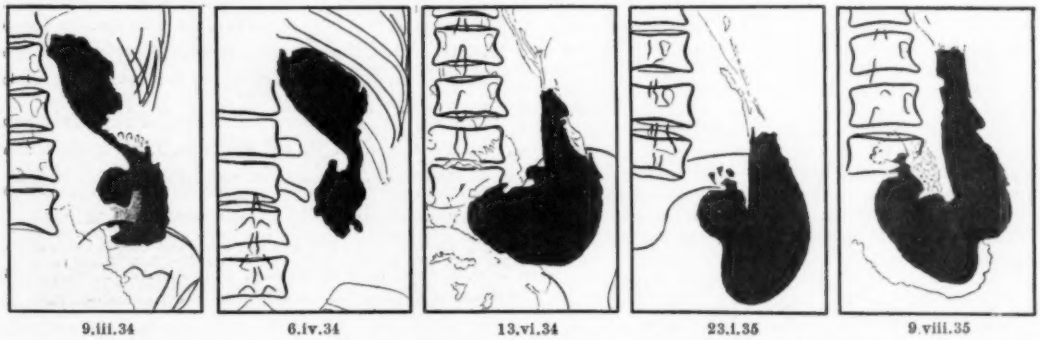
It behoves us, therefore, to distinguish between actual obstruction and retention; and although radiography is a sure guide in advanced cases, a preliminary course of medical treatment is necessary to distinguish cases in which there is more gastric retention than actual obstruction from those in which surgery is essential for relief. This has been well brought out by Emery and Monroe.[24]

The only absolute proof of complete healing is that obtained by actual inspection of the stomach at operation, and this is rarely possible. The following details are instructive.

A man of 48 gave a history of six weeks' dyspepsia. On one occasion five years previously he had suffered from indigestion, but he had remained well in the interval. An ulcer crater was demonstrated on the lesser curve of the stomach (Fig. 10 A). A second examination after six weeks showed much diminution in the size of the ulcer crater (Fig. 10 B), but no further proof of his response was available until eight weeks later when he was suddenly seized with severe abdominal pain and admitted to another hospital as an abdominal emergency. A diagnosis of a perforated ulcer was most probable, but to the surgeon's surprise no lesion could be found in the stomach, and the cause of the emergency proved to be an acutely inflamed appendix. Such evidence of healing is seldom obtainable. It must be added that he lapsed from treatment and returned to me in ten months with a recurrence of his symptoms and the ulcer crater (Fig. 10 C).

Anxiety and tension seem to delay the healing process, and complete rest in bed is occasionally required before symptoms can be dispelled and before any impression can be made on the size of the crater. If there is mental unrest the use of sedatives to produce relaxation is desirable.

One of my female patients showed considerable tension and nervousness, and the healing of the large crater was not realised until treatment had lasted ten months. The history was five weeks, but much weight had been lost and the general condition was very poor. No demonstrable change in the size of the crater followed upon a month's treatment, but some diminution was apparent in three months and again five months, although ten



9.iii.34 6.iv.34 13.vi.34 23.i.35 9.viii.35

FIG. 11.—A huge crater arising from the lesser curve in a woman aged 62, who showed considerable emaciation (5 st. 9 lb.), but gave a history of only 5 weeks. The second film (taken prone) shows no improvement after a month's treatment, but at the end of 3 months the crater is considerably smaller. The last film, 18 months from the commencement of treatment, shows a normal state. Gain in weight from 5 st. 9 lb. to 8 st. 6 lb.

months elapsed before the crater actually disappeared (Fig. 11). After two years there is no recurrence; the patient is symptom-free and her weight has increased from 5 st. 9 lb. to 8 st. 6 lb.

In spite of the utmost attention the ulcer crater occasionally persists, and I have records of six lesser-curve lesions which did not respond to treatment. In one of these cases two admissions to a medical ward failed to dispel the crater and surgery was required. The details of this group are given in Table V.

TABLE V

Persistence of Ulcer Crater

Case and sex.	Age.	Duration of symptoms.	Remarks.
1. M.	50	15 years.	Active ulcer at operation.
2. F.	34	1 year.	Fatal hæmatemesis, sixth month.
3. F.	34	3 years.	Active ulcer; mid-gastric fibrosis.
4. F.	40	2 ,,	Sixth month, active ulcer.
5. F.	54	1 month.	Large crater sixth month; brain tumour.
6. F.	56	2 years.	Active ulcer at operation.

Position of Ulcer.—Lesser curve in each case.

In the second case hæmorrhage occurred in the sixth month and proved fatal. If a crater shows no sign of healing within three months surgical interference should be advised, and my failure to act on this principle undoubtedly resulted in this tragedy. No apparent explanation is available for the lack of response in the other patients, except No. 5.

The patient was a female, aged 54, who had had hæmatemesis after some mild indigestion. After six weeks a barium meal showed a lesser-curve ulcer, which was still present in twelve weeks' time. This was regarded as unusual, and exhortation for more thorough treatment was made. Further radiography in the sixth month showed a crater larger than on the two previous occasions. At this time the patient complained for the first time of giddiness and weakness in the right upper limb. The weakness of the arm progressed and the signs of a tumour compressing the upper cervical cord advanced rapidly. An attempt to locate and remove this tumour was unsuccessful, and a tumour arising from the bulb was seen producing a pressure cone compressing the bulb and upper cervical cord. The nature of the tumour is uncertain, for it was degenerate when an autopsy was performed. The stomach was the seat of multiple erosions as well as a large ulcer crater which first caused symptoms. While I cannot definitely state that the two lesions had any bearing upon one another, it is possible that the tumour did irritate the vagal nuclei in the medulla and that this repeated stimulation resulted in gastric erosions and hæmorrhage and a chronic ulcer which resisted treatment.

With the exception of these six cases we find undoubted radiological evidence of healing in more than 100 lesser-curve ulcers. This response to treatment occurred while the majority of the patients remained at their work, a fact which further supports the statement that ulcers heal readily. On the other hand, a crater which persists in spite of medical attention should certainly be looked upon with suspicion, and if at the end of three months it is still seen with X rays, operation should be considered.

So far, then, we have found nothing at variance with the experimental observations, and we can safely conclude that the vast majority of ulcers readily heal on medical measures.

(To be concluded)

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FURTHER OBSERVATIONS ON THE RÔLE OF THE TOXIN IN STAPHYLOCOCCAL INFECTION

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IN a previous paper[1] on staphylococcal toxin evidence was brought forward showing that certain strains of cocci are capable of producing a true leucocidin which destroys the phagocytes of human and rabbit blood and which is distinct from the hæmolysing and necrosing factor also present in the toxin.

The Medical Research Council recently promoted an inquiry, to which a contribution was made at the London Hospital, into the value of toxoid injections in the treatment of staphylococcal infection. This supplied an excellent opportunity for continuing the work on leucocidin and its significance. The present paper describes methods of making toxin and of estimating the leucocidin in toxin and the antileucocidin in serum, and provides fresh evidence indicating that α-hæmolysin and leucocidin are distinct entities. Finally the methods described are employed in connexion with human material in an attempt to determine the rôles of the two toxins in human disease, attention being chiefly concentrated on the leucocidin.

The Investigation

PREPARATION OF TOXIN

The medium employed has been soft meat—infusion agar at pH 7·6, containing 0·5 per cent. agar.

Medicine bottles make convenient vessels for the purpose; if they are filled about one-quarter full no medium escapes when they are laid flat on their sides, in which position the agar is allowed to set. They are then inoculated by a Pasteur pipette from a fresh broth culture, excess of fluid after spreading being removed as much as possible. The bottles, still horizontal, are placed

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in a desiccator from which the air is exhausted on the water-pump until the manometer reads about 600 mm. when it is replaced by a mixture containing 80 per cent. O_2 and 20 per cent. CO_2. The vessel is then incubated for 24 hours only.

Next morning the bottles are removed and are placed upright which causes the agar to fall to the bottom. A little shaking breaks it up so that it can be poured into filter paper in a Buchner funnel where it is sucked dry on the water-pump. At this point it is advisable to test the reaction of the filtrate and if it is inclined to be alkaline acidify until the colour with phenolsulphonephthalein is orange (about pH 7). The filtrate is then passed through a Berkefeld candle to sterilise it; a Seitz filter may be used but seldom removes all the cocci at the first filtration and a second filtration removes much of the leucocidin.

It has seemed to be important to use a medium with enough agar to present a reasonably firm surface for inoculation, but for the purpose of filtration through paper the softer the agar is the better. The optimum strength is about 0·5 per cent. agar and shaking should be avoided until after incubation.

The method of preparation used seems to permit the production of abundant leucocidin and of a fair but certainly not maximal hæmolysin. In the course of the present work it has been found that leucocidin is less stable than α-hæmolysin, the titre diminishing fairly rapidly, especially in the presence of free oxygen. But for the purpose of serum-toxin titrations it has been found desirable to use a comparatively large test dose of toxin, and in these circumstances toxins can be used for two or three months if kept sealed in a refrigerator.

Recently, however, I have found that filtration, whether through Seitz or candle filter, removes a variable quantity of the toxin. This effect, as might be expected, is greatest when the original concentration of toxin is low, and may be almost negligible with a strong toxin. It may therefore happen that a preparation which was originally strongly hæmolytic but feebly leucocidal may be found after filtration to be still strongly hæmolytic but without any demonstrable leucocidin.

The staphylococcal strains which have been used for the production of toxin were originally maintained in the refrigerator in blood broth, but it was found that this method was unsatisfactory for preserving their toxigenicity. Latterly Worth's medium has been used with better results, but there is still evidence of a gradual diminution in toxigenic power particularly affecting leucocidin production.

TESTING SERUM AND TOXIN

1. *Hæmolysin.*—It has now been established by Glenny and Stevens[2] following the work of Bigger, Boland, and O'Meara,[3] and Bigger,[4] that staphylococcal toxin may contain two separate hæmolytic factors, α and β. Since there is no evidence indicating that the β-toxin is of importance in human infection, the α-toxin only has been taken into account in the present work; and it has been assumed that the ability of the α-toxin to lyse rabbit red cells, to cause necrosis of living tissue, and to kill rabbits on intravenous injection is due to the presence of one factor which may be designated and estimated as α-hæmolysin.

The antihæmolysin content of all human and other sera tested in the course of the present work was estimated against the standard toxin B.8750 supplied by the Wellcome Laboratories, and this in its turn was always controlled against their K-serum B.8760, which is stated to contain per c.cm. 150 international units of antihæmolysin. In this paper all figures for antihæmolysin are given in terms of the international unit.

The hæmolytic activity of toxins has been estimated against K-serum and will be expressed as the L.H. dose—i.e., the smallest volume of toxin still hæmolytic for 1 per cent. rabbit cells after mixing with 1 unit of antitoxin.

2. *Leucocidin.*—No unit of antileucocidin has as yet been established nor is the existence of a specific leucocidin universally recognised. It is necessary therefore to describe how leucocidin and antileucocidin may be demonstrated and estimated.

For this purpose the washed cells of human blood have been used as a routine, the blood being first taken into 2 per cent. citrate in normal saline. It is advisable to reserve a few cubic centimetres of blood in a dry tube so that a supply of homologous serum is available.

For the test small tubes of 8 or 9 mm. internal diameter have been used. In serum-toxin titrations each tube receives 0·1 c.cm. toxin dilution and 0·1 c.cm. serum dilution, one of which is standard. These are mixed and allowed to stand for 5–15 minutes at room temperature. 0·1 c.cm. of washed concentrated cells is added and the tube again shaken and incubated for one hour. 0·1 c.cm. of homologous serum may then be added; this improves the quality of films made from the mixture and also prevents any further action of the toxin. The tubes are then re-shaken and a film is spread from each by platinum-loop, a method which has been found to cause less damage to the cells than spreading with another slide. Films are finally stained with Leishman. For estimating the titre of leucocidin in the absence of antibody the latter is replaced by saline.

After a little experience of the method the films are best examined under the ⅔ in. objective with a × 10 or × 14 eyepiece. The "bird's-eye" view thus obtained is invaluable for comparing different films while individual cells can be checked with the high power. The titre of a toxin is indicated by the highest dilution from which the Leishman film shows no recognisable polymorphonuclear neutrophils. The titre of a serum is given by the highest dilution in which recognisable neutrophils persist. The latter titration is therefore open to the objection that for the demonstration of the end-point a sufficient excess of toxin must remain to destroy all the phagocytes which are present. But it has been found that even in "normal" human serum the amount of antileucocidin is sufficiently large and variable to permit the use of a very large test dose of toxin, roughly 16 times the amount of fresh toxin needed to destroy the same number of leucocytes in the absence of all antitoxin. In these circumstances titrations with 100 per cent. differences are sufficiently accurate and give a clear end-point.

For the titration of immune horse-serum greater accuracy is desirable and can be obtained. It is then important that the toxin should be quite fresh so that a small excess may be demonstrable. It is also practicable to double the volumes of serum and toxin dilutions in each tube (to 0·2 c.cm. of each) while leaving the volume of cells at 0·1 c.cm. In this way successful titrations with 25 per cent. differences have been made.

It happened that for the first tests made on human serum in the course of the present work, a batch of toxin was used which was neutralised by its own volume of K-serum diluted 1 in 100 but not by 1 in 200. It was also found that the smallest amount of antileucocidin commonly present in normal human serum was equivalent to K-serum 1 in 100. This amount is therefore suggested as a useful antileucocidin unit, although in this paper all figures are given in terms of K-serum.

Toxins are standardised by finding the lowest dilution which is inactive after mixing with an equal volume of K-serum diluted 1 in 100. Since 100 per cent. differences have been employed in all titrations throughout the present work, it has been sufficient to find the highest dilution of a toxin which is still active after mixing with an equal volume of K-serum diluted 1 in 200. The toxin could then

be used in this dilution for the titration of unknown serum, being always controlled against K-serum in the critical dilutions of 1 in 100 and 1 in 200. For more accurate estimations smaller differences are necessary and, as has been indicated above, can be used.

The antileucocidin here discussed appears as a true antibody to be found in the serum of horses and rabbits following the injection of leucocidal toxin. It also occurs in the serum of patients in the course of staphylococcal infection. Tests which have been made on horse serum indicate that the antileucocidin content may be concentrated in the pseudoglobulin fraction with the antihæmolysin.

THE LACK OF RELATIONSHIP BETWEEN α-HÆMOLYSIN AND LEUCOCIDIN AND BETWEEN THEIR ANTIBODIES

The experiment shown in Table I. compares the activity of two filtrates and shows that the ability of a staphylococcal strain to produce α-hæmolysin is unrelated to its ability to produce leucocidin. One

TABLE I

Filtrate.	Saline or serum.	Filtrate dilutions. 1/1	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
W.46	Nil.	..	..	..	..	..	..	H +	H +	H +	H ±
,,	K/200	H +	H +	H +	H +	H —	..	..	..	..	..
,,	Saline.	L —	L —	..	..	..	..	..	..	..	..
,,	K/200	L —	L —	..	..	..	..	..	..	..	..
C.	Nil.	..	..	H +	H +	H +	H ±	H ±	H —	..	..
,,	K/200	H —	H —	..	..	..	..	..	..	..	..
,,	Saline.	..	..	..	..	..	..	L +	L +	L +	L —
,,	K/200	..	..	..	L +	L +	L —	..	..	..	..

W.46 = Wood 46.
H + complete hæmolysis of 1 per cent. rabbit cells.
L + = complete destruction of human neutrophils.

of these toxins was produced by the well-known strain Wood 46, and the other, toxin C, by a coccus isolated from a large carbuncle.

If filtrate Wood 46 contains 16 times the amount of hæmolysin present in filtrate C, and the latter contains at least 250 times the leucocidin present in Wood 46, it would seem that α-hæmolysin and leucocidin must be distinct.

That antihæmolysin and antileucocidin also vary independently of each other is illustrated by the example of a horse immunised at the Lister Institute by Dr. McClean. This horse had previously been immunised against α-hæmolysin and its serum, at the beginning of the experiment here described, contained approximately 150 units antihæmolysin and 0·5 K antileucocidin. After immunisation with a toxin prepared in this laboratory, containing a moderate α-hæmolysin and fairly strong leucocidin, the serum titres were approximately 100 units antihæmolysin and 4 K antileucocidin, the former having fallen slightly while the latter increased eightfold.

EFFECT OF TOXIN ON THE RABBIT LEUCOCYTE

If rabbit's blood is substituted for human in the leucocidin titration of a filtrate which contains a feeble α-hæmolysin but powerful leucocidin, the result will be comparable to that obtained by the use of human cells; the phagocytes will be destroyed by dilutions of toxin which leave the red cell untouched. The rabbit neutrophil, in fact, appears to be somewhat more susceptible to leucocidin than is the human cell.

But if a filtrate strong in α-hæmolysin but almost wholly lacking in leucocidin, such as is produced by strain Wood 46, is tested against both human and rabbit blood, the results of the two titrations will be strikingly different. With the human cells in very low dilutions of the toxin there may or may not be some degree of hæmolysis or of damage to the leucocytes or both. This destructive effect has usually disappeared in dilutions as low as 1 in 4, and it is impossible to decide whether it is due to a slight susceptibility of the leucocytes to α-hæmolysin, to a trace of true leucocidin, or to other factors, possibly non-specific, present in undiluted filtrates. With rabbit blood hæmolysis, of course, occurs, but this is accompanied quantitatively by destruction of the leucocytes. There seems to be no reason to attribute this phenomenon merely to the accompanying hæmolysis, since in the case of human cells hæmolysis is not necessarily accompanied by any destruction of the leucocytes. It would rather seem that the rabbit leucocyte, like the rabbit red cell, is destroyed by α-hæmolysin against which human cells, both red and white, are relatively, if not absolutely, resistant.

The appearance of a rabbit leucocyte destroyed by α-hæmolysin is different, as a rule, from that of a human or rabbit cell destroyed by true leucocidin. In the latter case the cell, in an effective concentration of leucocidin, takes up a spherical form, the granules being arranged mainly at the circumference; in the presence of an excess of toxin the cell bursts and the granules are set free, and this appears to occur invariably in the making of a dried film once the cell has become spherical. But the rabbit neutrophil, killed by α-hæmolysin, appears to be less fragile and commonly retains the granules, clustered in one part of the cell, even in a dried film.

It seems possible that this difference in the morphology of the rabbit neutrophil, according as it is killed by α-hæmolysin or true leucocidin, may account for the existing uncertainty as to staphylococcal leucocidin, whether it is to be regarded as distinct from, or identical with, α-hæmolysin. It is possible that the different methods available for the demonstration of leucocidin may yield essentially different results. Thus the Neisser-Wechsberg test is based on the fact that a live leucocyte consumes oxygen and will therefore decolorise methylene-blue and that a dead cell will not. But there is no reason to assume that the granules or other substances released from a cell destroyed by true leucocidin should not still be capable, for a time, of absorbing oxygen. Further work is clearly necessary on the subject, but it may be pointed out that tests such as the Neisser-Wechsberg provide less direct evidence of the condition of cells than does the microscope and have the further disadvantage that they involve the use of animal and not human cells.

THE ANTITOXINS IN NORMAL HUMAN SERUM

Many human sera have now been tested for staphylococcal antitoxin by these methods. Amongst them 55 normal sera taken at random from those sent for the Wassermann test may be considered first.

It soon became obvious that the antileucocidin in human serum varies much more than the antihæmolysin. But the quantity of serum available was usually too small to allow a separate series of dilutions for each factor. As a routine therefore four tubes of comparatively widely spaced dilutions were used for each form of test, the first tube containing undiluted serum and each of the others three-eighths of the quantity in the preceding tube. Thus

serum, which completely neutralised the test dose of hæmolysin in the first tube only, contained 0·4 unit, in the second 1 unit, in the third 3 units, and in the fourth 8 units. The figures for the leucocidin tubes in terms of K-serum were 0·01 K, 0·027 K, 0·07 K, and 0·19 K.

Of 55 sera, 41 were found to contain 0·4 unit of antihæmolysin per c.cm., 13 contained 1 unit, and one 3 units, giving an average of 0·59 unit. This figure is probably a little lower than would have been obtained by a more accurate estimation, but it agrees sufficiently with the figures obtained by other workers.

In the antileucocidin estimations, 10 sera were equivalent to 0·01 K, 18 to 0·027 K, 19 to 0·07 K, and 8 to 0·19 K or more. The average figure thus obtained is 0·063 K, but if the 8 sera with titres of 0·19 K or more are omitted the average of the remaining 47 is 0·041 K. This latter figure is probably the more useful, for, as will be shown later, a serum titre of 0·19 K is usually indicative of existing or recent staphylococcal infection.

CULTURAL AND SEROLOGICAL INVESTIGATIONS CARRIED OUT ON PATIENTS

During the past eighteen months staphylococcal toxoid, as supplied by the Wellcome Laboratories, has been used at the London Hospital in the treatment of a series of cases of staphylococcal infection, the patients selected being for the most part examples of uncomplicated chronic furunculosis. A sample of serum was first obtained and then a series of injections was given at weekly intervals beginning usually with 0·25 c.cm. toxoid diluted 1 in 10 and working up to 0·5 c.cm. undiluted. After a total of at least 1 c.cm. of undiluted toxoid had been injected a second sample of serum was obtained.

In addition cultures were made when possible from lesions and latterly also from the anterior nares in order to confirm Dolman's observation [5] that in chronic furunculosis virulent cocci are often present in the nose for long periods and may be carried from there to other parts of the body by the fingers. Eighteen cultures were made from the nares of patients not suffering from nasal lesions, and in all but 4 of these *Staphylococcus aureus* colonies grew out. From 7 of these strains filtered toxins were prepared and compared with toxins produced by cocci isolated from a lesion in the same patient. In all but 1 case the two toxins were sufficiently similar to suggest that the lesion-producing strain was being carried in the nose.

SERUM-ANTITOXINS IN CHRONIC STAPHYLOCOCCAL INFECTION

In a separate paper Dr. Burrows proposes to discuss the clinical effects observed in patients treated with toxoid injections. Only laboratory results therefore will be considered here.

Table II. shows the findings in 22 cases in which the full course of injections was given and in which the antihæmolysin and antileucocidin content of the serum was estimated both before and after treatment.

In this series the average figures for antihæmolysin before and after treatment are 1·8 units and 8·3 units respectively; but in only 4 cases was the average figure of 1·8 reached or surpassed before treatment, and of these 2 were cases of long-standing acne complicated by staphylococcal infection. If these two cases, Nos. 2 and 5, are omitted, the average titre before treatment is 1·14 units, a figure less than twice the normal 0·59.

The average antileucocidin titres before and after treatment are 0·22 K and 0·24 K. The insignificant difference between these two figures is probably due to the fact that the toxoid used was prepared from filtrates of the type obtained from strain Wood 46, which gives very little leucocidin. But the average titre before treatment, 0·22 K, is important if the normal figure is accepted as 0·043 K. This five-fold rise was presumably due to the presence of

TABLE II

Case.	Sex and age.	Anti-hæmo-lysin units.		Anti-leuco-cidin in terms of K-serum.		—
		B.	A.	B.	A.	
1	M41	2	3	0·1	0·1	Boils 35 years.
2	M28	5	11	0·32	0·32	Acne + +. Boils 6 years.
3	M22	1·5	3	0·16	0·16	Boils 1 year with interval.
4	F 20	1·5	8	0·08	0·16	Diabetic. Boils 3 months.
5	M28	3	11	0·08	0·16	Acne + +. Boils many years.
6	M34	3	11	0·08	0·04	Boils 4 months.
7	F 45	0·4	5	0·04	0·08	Acromegaly. Blepharitis 4 years. *S. albus.*
8	F 14	1·5	17	0·16	0·16	Severe boils on face 2 years. Mentally feeble.
9	M34	1	26	0·16	0·08	Boils 18 months.
10	M36	0·7	5	0·08	0·32	8 months severe boils.
11	M22	0·7	5	0·16	0·32	1 year boils with interval following toxoid treatment.
12	M39	0·7	5	0·32	0·32	Boils 3 months.
13	F 31	1·5	8	0·64	0·32	Recent suppuration of glands of neck.
14	F 29	1·5	3	0·32	0·32	Boils 18 months with interval following toxoid.
15	M28	1	8	0·32	0·32	Boils 5 years.
16	F 20	0·4	2	0·08	0·08	Boils 9 months.
17	M59	0·4	5	0·32	0·32	3 weeks carbuncle.
18	M51	0·7	26	0·32	0·64	2 weeks large carbuncle.
19	M23	1	5	0·16	0·16	Boils at intervals for 7 years.
20	F 12	0·7	3	0·16	0·16	6 months boils in axilla.
21	F 45	1·5	5	0·64	0·64	9 months many boils.
22	M40	1	8	0·08	0·16	2 weeks boils.

B. = before; A. = after.

infection and its amount is significant. It suggests that in cases of chronic superficial staphylococcal infection the spontaneous serum-antitoxin response to leucocidin is better than that to hæmolysin.

This conclusion is supported by a consideration of the individual cases in the present series. In Cases 4, 5, 10, 11, 18, and 22, the antileucocidin titre rose between the two tests and this can be correlated with a persistence of the infection during the period of treatment, which was noted in all these cases. In Nos. 9 and 13 the antileucocidin titre fell slightly and no lesions occurred while the injections were being given. On the other hand, one case, No. 6, was still getting occasional boils at the end of the course but his antileucocidin titre, originally low, had fallen.

Nine other cases of primary superficial staphylococcal infection were treated with toxoid but through various accidents of non-attendance the second sample of serum at the end of treatment was not obtained. It is legitimate to add the figures obtained from the original sera of these patients in order to increase the number of cases on which the average titre in serum before treatment is based. The average figure for antihæmolysin in 29 cases thus becomes 1·2 units and for antileucocidin 0·25 K, Cases 2 and 5 in the original series being again omitted.

SERUM-ANTITOXINS IN CASES OF SEVERE INFECTION

The serum was also examined in 8 cases of more acute and serious staphylococcal infection. (Table III.)

This series is admittedly too small to be of much statistical value yet the cases fall into two groups, the first four being bled one week or less after the infection began and the second group after from two weeks to a month. The difference in the serum-antibodies

between the two groups is very striking. In the first group, the second and fourth cases were rapidly fatal, but the other two, both examples of face infection with much œdema, were clinically "settling" when the serum was taken. It seems, therefore, that with sound non-specific treatment clinical improvement may take place before the antibody titre is appreciably raised. Three cases in the second group show the typical rise of antihæmolysin titre which occurs after deep-seated staphylococcal infection, but in addition there is an even greater proportionate rise in antileucocidin. The figure of 2·5 K, twice obtained, appears both remarkable and significant. The other case, No. 6, one of severe hand infection, showed a great rise in antileucocidin titre but none in antihæmolysin. There is no reason to doubt the accuracy of this titration, but it was unfortunately impossible to confirm it on a second sample of serum, since the patient when on the point of recovery died of an intercurrent infection.

TABLE III

Case.	Sex and age.	Anti-hæmo-lysin units.	Anti-leuco-cidin in terms of K.	Remarks.
1	F 53	0·4	0·02	Lip infection with œdema. Bled after 1 week.
2	M 11	0·4	0·04	Ileum infection fatal. Bled within 1 week.
3	M 7	0·4	0·08	Nose infection with much œdema. Bled within 1 week.
4	F 23	0·4	0·01	Lip infection. Fatal.
5	M 53	8	2·56	Subscapular infection. Bled after 4 weeks.
6	M 32	0·4	1·28	Infected hand.
7	M 15	5	1·28	Osteomyelitis of femur. Bled after 2 weeks.
8	M 35	5	2·56	Multiple deep abscesses Bled after 1 month.

TOXINS

In a previous paper [1] evidence was brought forward indicating that it is usual to find that strains of staphylococci isolated from serious lesions are capable of producing leucocidin in considerable amount, whereas it is generally agreed that no such correlation can be made between virulence against human beings and the ability to produce α-hæmolysin. In the course of the present work toxins were prepared from 25 strains isolated from furunculosis cases, from 6 strains derived from cases of serious infection, and from 5 strains associated with sycosis barbæ. It was found that hæmolysin production bore no relationship to the severity of the lesion from which a strain was isolated; but that all the strains from the cases of serious infection and all but 4 of the 25 strains from boils produced leucocidin in considerable amount, while no strain derived from sycosis produced any demonstrable leucocidin at all. There can be no doubt that these results have been modified to some extent by the recent observation that filtration of a toxin removes or greatly diminishes a toxic factor which is only present in small amount and thereby exaggerates differences of toxigenicity of different strains. None the less it seems probable that strains capable of invasion of tissue, such as occurs in the true boil and in more serious lesions, will usually be found capable of producing leucocidin in considerable amount, whereas in sycosis invasion of tissue is slight and the cocci present appear to be feeble leucocidin producers.

Discussion

It is now generally admitted that staphylococcal toxin has several different properties. The majority of workers hold that its α-hæmolytic, necrosing, and lethal activities are probably due to the same substance. The β-hæmolysin and the coagulase have been shown to be separate bodies.

As regards the leucocidin, some workers hold it to be a distinct entity, whereas others believe that the α-hæmolysin destroys leucocytes as well as red cells, and that the staphylococcus does not produce a true specific leucocidin. The present work suggests that this divergence of opinion has arisen from the double action of α-hæmolysin on rabbit leucocytes and red cells, whereas many strains of staphylococcus produce also a true leucocidin capable of destroying all phagocytic leucocytes both in human and rabbit blood, but without effect on red cells and lymphocytes. This leucocidin is capable of acting as an antigen and gives rise to a specific antibody either on injection or following its liberation into the tissues by the cocci in the course of infection.

RÔLE OF THE DIFFERENT TOXINS IN STAPHYLOCOCCAL INFECTION

It would be very unwise to attribute all the manifestations of staphylococcal infection to toxins produced by the cocci. For example, the remarkable ability of these organisms to survive on the skin and in the nares is probably a most important factor in the maintenance of chronic furunculosis. Cellular constituents such as the carbohydrate substance recently described by Julianelle [6] may be of the utmost importance, for example in the production of hypersensitivity. These two factors together may conceivably lie at the root of the difficult problem of sycosis.

But the importance of the toxins, particularly when the infection has penetrated beneath the surface of the skin, is surely unquestionable. It is difficult not to correlate the massive local necrosis produced by the injection of α-hæmolysin into a rabbit's skin with the local necrosis which characterises the ordinary furuncle, the commonest of staphylococcal lesions. The comparatively poor development of circulating antihæmolysin in many patients suffering from chronic furunculosis may be due to the fact that the toxin is fixed locally in the tissues and does not therefore stimulate a general immunity. In a deeply seated abscess the absorption of toxin appears to be easier since the circulating antihæmolysin commonly rises considerably.

There is no need to labour the importance of a leucocidin capable of destroying the phagocytic cells of the blood. Its presence might be expected to facilitate the invasion of the tissue by the cocci and indirect evidence is here supplied in support of this view by the fact that strains of cocci, isolated from lesions in which real invasion of tissue has occurred in an otherwise healthy patient, nearly always produce leucocidin in considerable amount.

This finding has an important bearing on the methods used for the production of antitoxic serum which is used in cases of serious acute infection to prevent further invasion of tissue before the body has had time to produce its own antibodies. It is possible that in these cases the value of antitoxic serum depends more on the content of antileucocidin than of antihæmolysin. It is not uncommon to isolate from a rapidly fatal case of staphylococcal septicæmia an organism which produces only a feeble hæmolysin but a strong leucocidin. Even if it is true that toxæmia and death result directly from the accumulation of hæmolysin and not of leucocidin, treatment should be directed towards

the prevention of further invasion as well as to the neutralisation of toxin already formed.

Through the kindness of Dr. Parish of the Wellcome Laboratories it has been possible to estimate the antileucocidin titre of 24 "normal" horses. Of these, 6 had a titre of 0·2 K but none of 0·4 K, and of the remainder the majority showed a titre of 0·05 K or less. Two horses have been immunised against a toxin rich in leucocidin, one by Dr. Parish and the other by Dr. McClean at the Lister Institute, and in each case a titre of 4 K was obtained, the titration, however, being only approximate, since 100 per cent. differences were used both for the estimation of the toxin employed and in the ultimate test of the serum. More recently a sample of concentrated serum kindly supplied by Drs. Dolman and Kitching from the Connaught Laboratories, Toronto, has yielded a titre of approximately 12 K. It would seem probable that a figure of at least 3 K should be readily obtained in the crude serum by the use of a suitable toxin. In comparison with these figures it would seem to be rare for a horse immunised with hæmolytic filtrates such as are yielded by strain Wood 46 to attain a titre of more than 1 K in the crude serum. In the near future it is intended at the Wellcome Laboratories to immunise a horse against a leucocidal toxin in which the hæmolysin has been neutralised, in the hope of establishing, if possible, a maximum antileucocidal figure for future reference.

The importance of leucocidin in chronic infection is probably much less than in the acute case, particularly with regard to treatment by toxoid. Whereas in chronic infection the patients often develop little circulating antihæmolysin, their antileucocidin response is usually considerable. It may be for this reason that serious staphylococcal infection seldom occurs in patients already suffering from chronic furunculosis. Even so, it would seem on general grounds to be desirable that the antigenic efficiency of toxoid should be maintained with reference to leucocidin as well as to α-hæmolysin.

Summary

1. A method is described for obtaining a staphylococcal toxin which, with a suitable strain, is reasonably rich both in α-hæmolysin and leucocidin. It is observed that filtration may remove all leucocidin from a toxin originally feeble in this respect.

2. Methods are given for the estimation of leucocidin in toxin and of antileucocidin in serum. A convenient unit of antileucocidin is suggested in terms of the standard K serum, B 8760, issued by the Wellcome Laboratories.

3. A description is given of the susceptibility of the rabbit leucocyte to α-hæmolysin, towards which the human cell is relatively if not absolutely immune.

4. Confirmation is supplied of Dolman's finding that in chronic furunculosis virulent staphylococci are commonly carried in the anterior nares.

5. Evidence is produced indicating that in chronic superficial staphylococcal infection the antileucocidin of the serum commonly shows a significant increase, whereas the antihæmolysin often does not; also that in deep-seated infection the rise in the antihæmolytic titre of the serum is accompanied by a relatively greater increase in antileucocidin.

6. A comparison of the toxigenic capacity of a number of different strains of cocci suggests that strains which have succeeded in invading human tissue will commonly be found capable of producing leucocidin in considerable amount.

The importance of the concentration of antileucocidin in antitoxic serum is discussed.

My thanks are due to Dr. P. N. Panton for his unfailing advice and criticism; to Dr. H. J. Parish and Dr. Joyce Wright of the Wellcome Laboratories for their criticism and for the supply of standard serum and hæmolytic toxin; also for their collaboration and that of Dr. McClean, of the Lister Institute in the immunisation of horses; and finally to Dr. Burrows and other members of the medical staff of the London Hospital for access to the human material on which the work is based.

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OPERATION FOR FEMORAL HERNIA

BY A MIDLINE EXTRAPERITONEAL APPROACH

WITH A PRELIMINARY NOTE ON THE USE OF THIS ROUTE FOR REDUCIBLE INGUINAL HERNIA

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THE admission of a case of femoral hernia to my surgical unit is so rare as to be something of an event. During the past year (July, 1934–June, 1935) we have operated on 2 such cases as against 205 of inguinal hernia, a high incidence considering the fact that in the nine previous years only 3 other patients with femoral hernia were admitted to my beds. I venture therefore to describe an operation that I have performed once only, in the hope that others with better opportunity will test the method and assess its value.

At Kasr-el-Aini Hospital the frequency of bilateral lesions of the urinary tract has made us familiar with the midline extraperitoneal approach to the pelvic ureter, and using this route recently I was struck by the admirable exposure it gave of the whole region of the femoral ring. In a thin patient, as soon as my hand had displaced the peritoneal sac from beside the bladder, the view obtained of the four relevant structures—Gimbernat's ligament, the hinder edge of Poupart's, the fascia covering the pectineus, the external iliac vein—was like that in a specimen prepared for demonstration. This clear view showed me that the femoral ring could easily be closed by turning forward a flap of the dense fascia covering the pectineus muscle, and sewing it to the hinder edge of Poupart's ligament.

We soon had the opportunity of putting these ideas into practice. A girl aged 14 (1935, No. 13647), who had developed phthisis five years previously, was admitted with bilateral femoral hernia of one year's duration. Both herniæ were reducible, and both projected through the saphenous opening without turning towards the anterior superior spine (Fig. 1).

THE OPERATION

Under gas-oxygen anæsthesia on July 10th, 1935, through a midline incision, I separated the recti at and below the navel, and stripped the unopened peritoneum from the sides of the bladder and from the pelvic wall. This at once gave a notable view

of both hernial sacs, which stood out from the peritoneum like horns from a snail, and passed into the femoral rings (Fig. 2). After a very little blunt dissection the two sacs were delivered from the canals and brought within the abdominal wall; they were

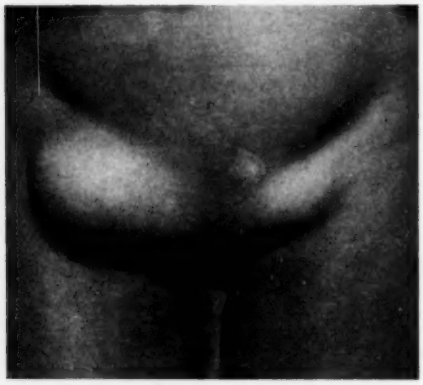

FIG. 1.—The two femoral herniæ. (The incision extended from the pubic symphysis to the left side of the navel.)

then excised and their origins were closed. The right femoral ring admitted two fingers; the left was slightly smaller. Both were shut off in the following way, the entire operation "from skin to skin" lasting 32 minutes.

The fascial flap.—After retracting the external iliac vein outwards, I made two incisions through the fascia covering the steep slope of the pectineus muscle; the first, just in front of and parallel to Cooper's ligament, extending out for 1½ inches from the free edge of Gimbernat's; the second running down and forwards at right angles to the outer end of the first. I then had a triangular flap of strong fascia—pedicled in front—which I turned forward and united by sutures to the hinder edge of Poupart's ligament. This closed the femoral ring (Figs. 3 and 4 A). The raw upper surface of the pectineus muscle remained bare, and to cover it I sutured the hinder edge of Poupart's ligament to Cooper's ligament. The second line of suture, however, was not essential and would seldom be so easily accomplished as in this case where Poupart's ligament was extremely lax.[1]

I found that my assistant's hand formed the best retractor; his palm held the abdominal wall, while the tips of his fingers drew the external iliac vein aside as they slid outwards over the fascia covering the the pectineus.

The wound healed by first intention.

[1] The fascial flap can be raised in the opposite direction with its pedicle *behind* at Cooper's ligament (Fig. 4 B). This avoids leaving any raw surface of the pectineus exposed, though I doubt whether that has any real importance since the muscle covers the pubic ramus thinly at this proximal level and the danger of a recurrent hernia burrowing into its fibres is unlikely.

COMMENT

This method appears to have several advantages, apart from its obvious use in bilateral cases.

(1) When the recti have been separated, the sac is found by a gentle movement of the hand, without dissection. Its proximal part is at once delivered naked to the surgeon, and serves as a guide to the rest.

(2) The variably developed, unreliable, conjoined tendon plays no part in this operation. At best its arch is resilient and must be fastened under stress to Cooper's ligament. Should occasion, however, arise for its use, better access to the "tendon" is got by this route than by opening the inguinal canal.

(3) In contrast to the conjoined tendon the thick fascia covering the pectineus muscle can be relied on to furnish a strong flap that will join Poupart's ligament without tension and close the femoral ring.

(4) The immediate access to a wide surface of parietal peritoneum that is given by this approach makes it possible to close and invaginate the sac at its actual origin, abolishing the small diverticulum which may remain to favour recurrence when the neck of the sac is drawn *down* into a wound for ligature.

THE MIDLINE METHOD IN INGUINAL HERNIA

After the foregoing account was written I made (through the courtesy of Prof. A. F. Bernard Shaw) a preliminary trial of this extraperitoneal route in a cadaver with an inguinal hernia of moderate size. I found that the midline incision gave the same admirable exposure of the origin of the sac as in femoral hernia. The sac could be easily delivered, extraperitoneally, within the abdominal wall, and dealt with there by ligature and invagination. Access to the internal ring was good, and it was easy to repair it from within. Further experience has shown that this repair is always easy if the anæsthetist keeps the abdominal wall lax. Seen by this approach, the orifice presents an unusual and striking appearance. Its posteromedial lip is beautifully defined by a thickening of the transversalis fascia. The anterolateral boundary of the ring is formed by unthickened fascia covering the deep surface of the internal oblique muscle. By suturing these two

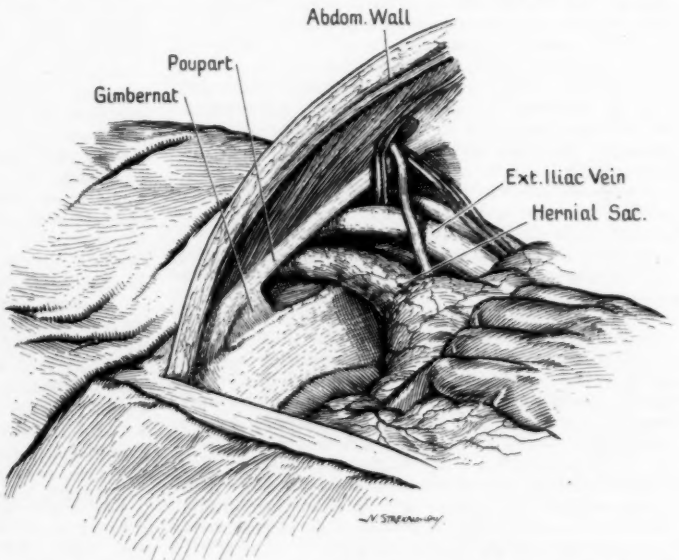

FIG. 2.—The right femoral sac seen from the left side, after separating the recti, when the hand has displaced the peritoneum.

boundaries of the ring together from above downwards the internal ring can be narrowed until it just transmits the cord.

I used the method first for inguinal hernia in the operating theatre in a case that was direct, bilateral, a pedicled flap cut from the deep surface of the rectus muscle.

True and false necks.—Recently the extensive view of the parietal peritoneum obtained by the midline approach has revealed a condition that may have an important bearing on recurrence after "radical cure." The tubular hernial sac often grows much wider just inside the internal ring and forms there a peritoneal pouch proximal to the so-called neck. The junction of this pouch with unevaginated parietal peritoneum is the true neck, origin, or inlet of the sac, and unless that inlet is shut recurrence is likely. It would however be difficult through the ordinary approach to avoid mistaking the wide proximal pouch for unevaginated peritoneum; the false, apparent neck would then be closed instead of the pertinent real one (see Fig. 5).

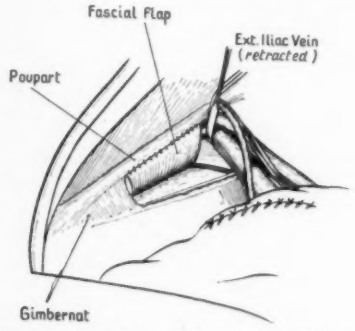

FIG. 3.—The flap cut from the pectineus fascia turned forward for suture to Poupart's ligament.

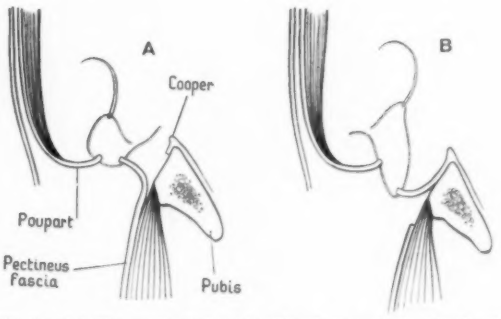

FIG. 4.—(A) The same flap as in Fig. 3, seen in longitudinal section. (B) Alternative method of cutting the fascial flap. The pedicle is at Cooper's ligament.

and reducible. After separation of the recti I was able at once to pick up each sac, and both were completely isolated and delivered within the abdominal wall in less than five minutes from the first incision. Narrowing of the ring too was rapidly accomplished by suture from within.

Indirect hernial sacs naturally are more closely attached by their outer surface to the spermatic vessels, but at this level, where the vas is already turning sharply away from the sac to enter the pelvis, their separation is simplified. It must however be remembered that when the peritoneum is raised from the abdominal wall, the vas deferens—though placed in extraperitoneal fat—will be raised too. The vas is lifted up on the tough fibrous cord of the obliterated hypogastric artery which underlies it and adheres to the peritoneum. Traction on the hernial sac also withdraws the vas, with the spermatic vessels, from the scrotum, so that sac, vessels, and vas lie loose and intricate within the belly wall.

It is notoriously hard to find planes of cleavage between slack structures, but here the difficulty is easily met by a second assistant, who grasps the scrotum beneath the towels and gently draws the spermatic cord towards the patient's feet. This simple precaution restores anatomical relations and greatly expedites the isolation of large hernial sacs.

The origin of the sac, which is closed by ligature or suture, can often be invaginated. To avoid injuring gut the "purse-string" should be passed while the sac is still open.

If reinforcement were required for the closure of the internal abdominal ring, it would be easy to cover the weak spot with

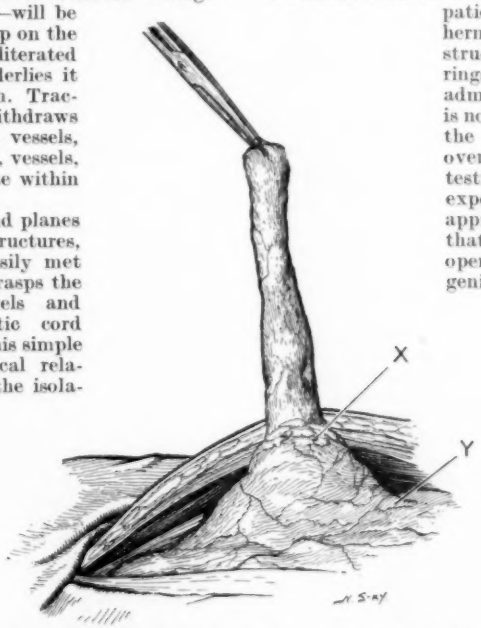

FIG. 5.—A wide pouch or diverticulum proximal to the false fat-encircled "neck" of the hernial sac (X)—a common finding (see text). The true inlet of the sac is where this pouch joins parietal peritoneum (Y). The junction is sometimes marked *internally* by a rim-like thickening.

The more I use the midline route for operating on patients suffering from inguinal hernia only, the more I am struck by the fact that *femoral* rings often gape widely and admit a finger easily; yet there is no corresponding evagination; the peritoneum lies smoothly over them. I believe that the testimony of the wide field exposed by the extraperitoneal approach will confirm the theory that, apart from wounds or operation, a preformed congenital sac is an essential cause of most inguinal hernia. Cure of the condition will only be radical, in the literal sense of that word, when, after excising the sac, we close its actual origin, and my impression is that in many cases repair of the canal must be superfluous, especially when the canal is valvular and the hernia indirect.

My thanks are due to Dr. Mohamed Hasan el Zeneini, resident surgeon in the surgical unit, for much useful coöperation, and to Mr. N. Strekalovsky for his excellent drawings.

TEMPORARY PARALYSIS OF THE DIAPHRAGM

IN THE TREATMENT OF PULMONARY TUBERCULOSIS

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IT is almost five and twenty years since Stuertz and Sauerbruch first induced artificial paralysis of the diaphragm as an accessory mode of treatment for pulmonary tuberculosis. Sauerbruch had practised phrenicotomy—or section of the stem of the phrenic nerve within the chest—at a much earlier period when carrying out the radical treatment of diaphragmatic hernia.

As phrenicotomy became more generally performed, it was apparent that paralysis of the diaphragm often failed to appear after the operation, and in 1922 Felix, after his masterly study of the anatomy of the nerve and its accessory branches, proposed and carried out the operation of phrenic evulsion, in which the nerve was exposed in the neck and its peripheral end was seized with forceps and evulsed from the chest. In this operation often a length of 10 cm. of the nerve was removed and a permanent paralysis of the hemidiaphragm naturally resulted.

In 1931 one of us (L. O'S.) published the results of a series of operations of the Felix type carried out in the Sudan; and up to that date phrenic evulsion appeared to satisfy his requirements except in the rarest cases. In that year, however, he had the opportunity of examining a patient subjected to a phrenic evulsion on the left side which had been followed by very distressing symptoms probably caused by a displacement of the stomach following an ascent of the diaphragm to the level of the third rib. Despite the rarity of this syndrome—Davison has recently reported 568 cases of phrenic evulsion without complication—this case was enough to bring the question of temporary paralysis into consideration, especially as other examples of gastric and cardiac distress following phrenic evulsion on the left side have been recorded by Rickers and by several others.

During the last three years it has been our usual policy in the treatment of pulmonary tuberculosis to induce a temporary rather than a permanent paralysis of the diaphragm. The only notable exception to this rule is in an operation undertaken for the obliteration of a persistent empyema cavity in the chest, when permanent paralysis is induced.

TECHNIQUE

The technique of operation is much the same as that described in a previous paper (L. O'S.).

The patient is given an injection of omnopon gr. 1/3 and scopolamine gr. 1/150 an hour before the operation. During the operation he lies on his back with a narrow sandbag beneath the neck, fitting exactly between the occiput and the first dorsal vertebra, with his chin pointed up and away from the operation area. The line of incision, two fingers-breadth above the clavicle, is some 2 cm. in length, passing horizontally over the posterior border of the sternomastoid muscle in such a way that two-thirds of the incision is lateral to the muscle. An intradermal weal is raised with a solution of ½ per cent. Novocain in the line of the incision, and with due precautions 3 c.cm. of the solution is injected into the deeper underlying tissue.

After incision of the skin and platysma the posterior border of the sternomastoid muscle is exposed, defined by blunt dissection and retracted inwards. The posterior belly of the omohyoid is then exposed and retracted downwards and then the fascia covering the scalenus anticus comes into view. A subfascial injection of the anæsthetic solution is then carried out and, after a minute incision of the fascia, the surface of the muscle is defined by blunt dissection. The phrenic nerve is exposed running an oblique course towards the inner border of the muscle, and in the lower part of the wound it is seen disappearing beneath the transverse cervical vessels. The nerve is gently isolated, raised on a blunt hook, injected with novocain, and crushed with a strong pair of artery forceps. The wound is then closed by suture.

It will be observed that no attempt is made to identify and crush the accessory phrenic nerve, although this would seem in theory desirable. While recognising the importance of Felix's original work on the "neben-phrenicus," we can only state that the operation as described has produced paralysis in 43 out of the 44 cases, and in the single failure a more extensive dissection still failed to produce the desired result. In view of this we are disinclined to modify the simple technique outlined.

It must also be recognised that in phrenicothlasty,* as in phrenicotomy, there are certain local operative risks, and the operation should only be carried out by a surgeon sufficiently experienced to deal with the serious hæmorrhage which may result from the accidental wounding of an aberrant branch of the subclavian artery. It is well to remember that fatalities have been recorded from this complication. A second local complication, which may also have fatal results, is air embolism following a wound of the external or internal jugular vein. If part of a patient's lung is already rendered useless by disease, his reaction to the temporary blockage of part of the pulmonary circuit, which follows the admission of a small quantity of air into a systemic vein, is considerably more alarming than the trivial disturbance which is the only usual sequel to such an accident in a patient with healthy lungs.

RESULTS

In 43 out of the 44 cases which are the subject of this communication, phrenicothlasty produced a paralysis persisting for an average period of six months—in one case movement returned after five months and in another paralysis persisted for nine months—and it appears to give rather more consistent results than the alternative measures. In a recent account of the injection of alcohol into the nerve Morin records periods of paralysis ranging from five to fifteen months. In 4 of our cases a second operation was carried out when a further period of paralysis of the diaphragm seemed indicated, and in 1 of these paralysis failed to appear.

It is not our intention here to discuss the value of hemiparesis of the diaphragm in the treatment of phthisis. A recent review of the question by Morriston Davies renders this superfluous. There is also an analysis of 330 operations by Schwarzmann and Waltach and an account of 654 operations by Nehil and Alexander. The views expressed by one of us in an earlier paper as to the value of the operation have undergone little change. One of its most valuable uses is to supplement the régime of absolute rest imposed on the patient suffering from

* This term, derived from the Greek θλάω (I crush, or bruise), is perhaps preferable to "phrenic crush."

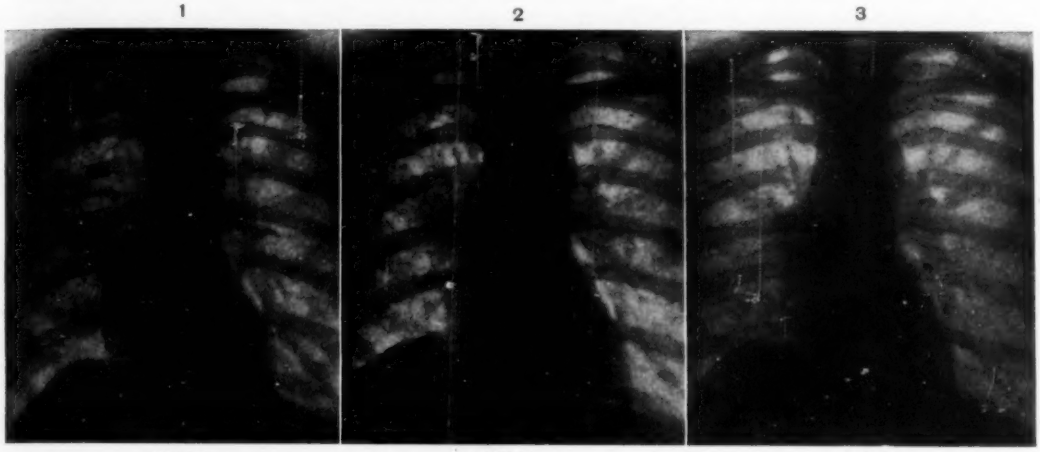

FIG. 1.—Cavity system in right middle zone. Sputum contains tubercle bacilli.
FIG. 2.—Right leaf of diaphragm raised and paralysed. No T.B. in sputum.
FIG. 3.—Right leaf of diaphragm raised but moving. No T.B. in sputum. Patient at work.

an exudative lesion. The old controversy as to the value of paresis of the diaphragm in the case of lesion of the upper lobe seems to have been settled by the work of Weber on the röntgenkymography of the lung. As Kremer and von der Weth have also shown, diaphragmatic movement has a very definite effect on the upper lobe provided adhesions have formed in the interlobar sulcus, and the expert radiologist is now in a position to decide this point with certainty before operation is contemplated. Phrenicothlasty is never considered as an alternative to artificial pneumothorax. It is sometimes used to supplement an incomplete artificial pneumothorax, and it is often employed, we believe usefully, as a test operation before proceeding to more radical surgery; only rarely is it carried out as an independent measure. We have probably made too little use of the operation as a palliative measure for the irritative cough, dragging pain, and dyspepsia of the late case of phthisis.

CASE-HISTORY

Male, aged 27; two years' history of pulmonary tuberculosis commencing with a large hæmoptysis. On admission the right lung showed cavitation in both upper and middle lobes, with increased root shadows on the left side (Fig. 1). Artificial pneumothorax was tried without success, and a phrenicothlasty performed on the right side in January, 1934; the sputum was then markedly positive. Paralysis of the right leaf of the diaphragm was produced, paradoxical movement being observed on screening. Fig. 2 shows the radiographic appearance 2½ months after operation—the gradual disappearance of the cavities on the right side and the clearing of the contralateral side will be noted. The sputum was now negative and there was complete subsidence of all constitutional symptoms, the patient (a former bank clerk) now being up all day and doing 4½ hours' daily occupational therapy in the village settlement.

The initial duration of paralysis of the hemidiaphragm was 7 months, and at the end of this period a second phrenicothlasty was performed to maintain the paralysis. After this second operation, normal movement was observed to have returned at the end of 5 months. Fig. 3 shows the radiographic appearance at the end of this period; the diaphragm on the right side is still somewhat raised, while the cavitation is now completely resolved.

The sputum has remained consistently negative and the patient has gained 22 lb. in weight. He has now returned to his normal employment.

CONCLUSION

Some have been led to advocate a crushing of the phrenic nerve rather than its evulsion because of the danger of producing some lesion within the chest during the latter procedure. We do not consider phrenic evulsion, discreetly and carefully performed, a dangerous operation but have adopted phrenicothlasty on quite other grounds. We have observed an increasing number of patients with bilateral phthisis for whom some form of bilateral collapse operation would offer a prospect, and the only prospect, of cure, but a paralysed diaphragm has ruled out such a possibility. In the young patient a paralysed hemidiaphragm does not produce signs of respiratory distress—indeed in a previous paper one of us has described patients who tolerated complete paralysis of the diaphragm with equanimity. But it has recently been suggested that in middle age paresis of the diaphragm may constitute a more serious handicap: Kochs found that phrenicotomy produced a greater reduction of vital capacity in middle-aged patients than in young patients. The possible detrimental effects of the paralysis on cardiovascular function in later life must also be borne in mind, and the recent experiments of Nissen and Wustmann on the effect of diaphragmatic movement on the caval blood flow are of interest in this connexion. We therefore believe that it will be of probable advantage for the patient described in the above case-history to have a healed tuberculous lesion and a moving diaphragm; for should his lesion again become active he is a suitable subject for any form of treatment which may be necessary, and if, on the other hand, his disease remains permanently arrested there is no chance of his having to pay for this benefit by an impairment of respiratory or cardiovascular function in his later life.

We wish to thank Dr. J. B. McDougall, medical director of Preston Hall, for permission to publish these cases, and Dr. A. Ross for his coöperation in their radiological investigation.

(*References at foot of next page*)

ACCIDENTAL TRANSMISSION OF MALARIA BY BLOOD TRANSFUSION

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LATE ASSISTANT PATHOLOGIST AND BLOOD TRANSFUSION OFFICER AT THE HOSPITAL

With a note by

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PATHOLOGIST TO THE HOSPITAL AND DIRECTOR OF THE BLOOD TRANSFUSION SERVICE

THE following is believed to be the first instance of the accidental transmission of malaria in the course of blood transfusion to be reported in this country.

The patient was a man aged 26. He was first seen by one of us (W. L. T.) in May, 1935, with a malignant growth of the nasopharynx; for this he received radium treatment at the Royal Hospital. He was readmitted in August, 1935, with a diagnosis of septicæmia secondary to an infection of the middle ear; he was then seriously ill and emaciated, and had been running a remittent temperature of up to 103° F. for five days. Under treatment the temperature subsided in a fortnight, leaving the patient in a very weak condition. A week later, although there had been no further evidence of activity of the infection, he appeared to be losing ground. A blood count showed: hæmoglobin, 38 per cent.; red cells, 2,040,000 per c.mm., and white cells, 7900.

In view of the anæmia it was decided to have recourse to blood transfusion, and a first transfusion was given on August 24th, 1935. As donor, a brother-in-law was used; blood of both donor and recipient belong to Group O (IV. Moss). Eighteen ounces of blood were withdrawn and administered. The transfusion was followed by considerable clinical improvement; on August 29th the blood showed Hb. 58 per cent., and red cells 4,220,000. A second transfusion was given on Sept. 9th. The same donor was again used and 10 oz. of blood was withdrawn and administered. Both transfusions were performed by S. K. On both occasions the blood was citrated; infusion was carried out by the three-way syringe; the infusion needle was introduced by vein puncture without incision.

On Sept. 12th, three days after the last transfusion, the patient developed a high intermittent fever with rigors. Examination of the blood on Sept. 17th showed: Hb., 38 per cent.; red cells, 2,440,000; white cells, 4400; no morphological abnormalities of red or white cells. Blood culture was negative.

The temperature and the rigors persisted and the clinical condition so impressed one of us (W. L. T.), who had had considerable experience of malaria in the Far East, with its general resemblance to tertian malarial infection, that a further examination of the blood was asked for. On Sept. 19th further films of blood were taken both about one hour before and actually during the occurrence of a rigor, and in these the parasite of benign tertian malaria (*Plasmodium vivax*) was demonstrated without difficulty. On treatment with quinine binhydrochloride grs. 20 daily the rigors ceased and the temperature rapidly subsided. Quinine was continued in decreasing doses for two months. The patient was last seen on Jan. 14th, 1936; he had then had no relapse, his general health had much improved, and incidentally no sign of the nasopharyngeal growth could be found.

The patient had never been out of England and the possibility of his having contracted malaria in this country appeared remote in the extreme. Suspicion fell on the infused blood. Inquiry elicited the fact that the brother-in-law who had acted as donor was a regular soldier who had served in India from 1927 to November, 1933. The only illness from which he had suffered while in India was sandfly fever; while abroad he had never had any rigors. In June, 1934, after his return to this country, he had a short series of shivering attacks each lasting two or three days; his own doctor gave him some medicine, after which these attacks ceased and he had been perfectly well since. While in India he had not received quinine prophylactically.

Examination of the donor's blood showed no malarial parasites.

NOTE BY DR. DYKE

The transmission of malarial infection by the infusion, either intramuscularly or intravenously, of infected citrated blood is of course a commonplace of antisyphilitic treatment. The main interests in the above case attaches to the transmission of the infection by the blood of a person who had never knowingly suffered from malaria. The infection was evidently contracted in India; but there seems to be no doubt that the donor experienced no symptoms of the disease while there. He was questioned as to his attack of sandfly fever; this appears to have been mild but true to type and the fever was unaccompanied by rigors. Symptoms of malaria did not appear until he had been six months in this country, and were then mild and unrecognised as such.

In all about a score of cases of transmission of malaria in the course of blood transfusion from donors not known to be suffering from the disease are now on record. The first was reported by Woolsey[1] in 1919. The transfusion of blood from an apparently healthy donor to a patient suffering from pernicious anæmia was followed on the same night by symptoms of malaria. Immediate examination of the blood both of donor and recipient showed malarial parasites, and in spite of the absence of symptoms the donor was evidently suffering from heavy malarial infestation. This is the only recorded case in which examination of the blood of the donor showed malarial parasites; their presence in sufficient numbers in the blood to be demonstrable in ordinary films apparently accounts for the extremely short incubation period of the disease in the infused subject.

The whole subject of the transmission of malarial infection in the course of blood transfusion has lately been minutely examined by Ackermann and Filatov[2] at the Leningrad Institute for Blood Transfusion. They have collected in all a total of 18 cases recorded up to the time they wrote. They are impressed with the danger of introducing malarial infection by the use of blood of donors who have ever dwelt in a district in which malarial infection is endemic. They experimented upon the effect of keeping blood with and without the addition of quinine.

For conservation of the blood they used a solution consisting of sodium citrate 5·0 g., sodium chloride 7·5 g., potassium chloride 0·2 g., and magnesium sulphate 0·04 g. to one litre of distilled water. To this was sometimes added quinine hydrochloride to the extent of from 0·2 to

(*Continued from previous page*)

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1·0 g. to the litre. The blood was stored at 4° to 6° R. (5° to 8° C.). They found that, whether quinine had been added or not, after 12 hours' keeping the blood was always infective; after 24–72 hours it was sometimes infective, after 96 hours never. The addition of quinine seemed merely to decrease the severity of infection and possibly in some instances to render the blood non-infective.

Since the appearance of the work of Ackermann and Filatov, a further case has been reported by Harvier, le Brun, and Lafitte [3] to the Société Médicale des Hôpitaux de Paris. The donor had been in Algiers for two years, ten years previous to giving the blood, and in Gaboon up to three years before; he had never knowingly suffered from malaria. He had regularly taken 0·25 g. quinine daily while abroad. In the discussion following the presentation of this case M. P. Émile-Weil said: "I have never had the annoyance of seeing malaria develop after a transfusion because I regard everyone who has been in the colonies or who has lived in a malarial country, even if they have not had fever, as being unrecognised malarial subjects (paludéen ignoré), and I refuse without having recourse to any biological tests to accept them as donors." M. Le Bourdellés, on the other hand, while admitting the existence of chronic cases only brought into evidence by the development of malaria after the infusion of their blood, expressed the opinion that these are "very rare occurrences and that a large number of malarial subjects after repatriation are completely cured from the clinical, hæmatological, and serological standpoints."

Various speakers in the course of this discussion made reference to "Henry's reaction" for the identification of malarial infection.

This reaction was described by Henry [4] in 1928. Proceeding from the fact that malarial infestation leads to the liberation in the blood stream of iron and of melanin, he tried to demonstrate the presence of antibodies against these substances in the blood of malarial subjects. Using as antigens an albuminate of iron in the form of "Methafer Bouty," and melanin derived from ox retinæ, he considered that he had been able to do this. Adida [5] in 1929 repeated Henry's work and reported very favourably on it as a means of diagnosis of malarial infection. The test has since received a certain amount of attention; Greig, van Rooyen, and Hendry [11] and Wiseman [12] have been unable to agree with Henry's postulates as to the nature of the test, but appear to think it may have some use in the diagnosis of malarial infection.

Apart from the case of Grubb [6] in which infection was conveyed from a recipient who was actually suffering from malaria to the donor, all recorded cases of the transmission of malaria by means of transfusion have been from subjects not known to be suffering from the disease. In those recorded by Oehlecker,[7] Schnitzler,[8] Mayanz,[9] Harvier and others,[3] and Nobécourt,[10] and in the case reported above the donors were unaware that they had ever had the infection. In those of Oehlecker, Nobécourt, and Harvier the donors, while resident in malarial districts, had regularly taken quinine.

The evidence as to the existence of malarial infestation in the blood of those who never knew they had suffered from the disease is irrefutable. It is probable that a latent infestation in course of time dies out, but it is at present difficult to set a term to its persistence. In Nobécourt's case a donor who did not know he had had malaria, and had left the region of endemic malaria in 1924, infected a recipient in 1931.

The facts make it clear that anyone who has resided in regions in which malaria is endemic is a potential carrier of the parasites, and that the use of such persons as donors is fraught with risk to the recipient. The reaction of Henry is still in the experimental stage, and until some reliable means of identifying latent infection is available it seems advisable not to use donors who have lived in districts where malaria is endemic.

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Clinical and Laboratory Notes

TECHNIQUE OF VARICOSE VEIN INJECTIONS

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AFTER surveying large numbers of patients who have had varicose vein injections, I am convinced that unsatisfactory results are chiefly due to bad technique. I have come to the conclusion that the majority of varicose vein injections are still given with the patient standing, because it is easier to introduce the needle in this position. Colt, Ramsay, and Morrison,[1] however, say that when one hears of patients with enormous varices being injected in the standing or sitting position it is evident that there is a lack of appreciation of the principles concerned. I would like to go further than this by condemning all varicose vein injections given in the standing position, and I will describe a satisfactory "empty vein" technique that can be used in all cases.

DISADVANTAGES OF INJECTIONS INTO DISTENDED VEINS

The first disadvantage of the standing position is the dilution of the sclerosing solution with the large amount of blood in the vein. This point has often been raised, but many still think that this can be overcome by using larger amounts of stronger sclerosing solutions; this is apt to be followed by a very severe localised reaction. The other disadvantages of injections into distended veins result from the high venous pressure; I do not think this point has been sufficiently emphasised. The high venous pressure causes extravasation of the sclerosing solution into the perivenous tissues, and often causes a perivenous cellulitis at the site of the injection; it has even caused an injection ulcer,[2] although the injection was given intravenously. A varicose vein already has impaired elasticity, and also probably excessive permeability of its endothelium; it is rational to assume that the venules of the vasa vasorum are also dilated and more permeable. In the injection treatment it is therefore advisable to assist the contraction of the vein as much as possible, in order to obtain the "stiction" effect, and yet to

avoid excessive reactions and liability to necrosis of the vein. These desirable effects have been found to be best produced by using an empty vein technique.

EMPTYING THE VEIN

Without an Esmarch's bandage it is impossible to produce an absolutely empty vein, but the more the limb is elevated the more empty do the veins become, and the degree of emptiness produced by this method is sufficient.

Attempts have been made to empty veins by complicated apparatus. Schmitt [3] used a double-barrelled syringe, after placing a proximal and distal tourniquet on the segment of the vein to be injected. He "emptied" the vein with one syringe, and injected the sclerosing solution with the other. Nobl [4] also used two constricting bands on the limb. The difficulty, however, lies in the presence of communicating veins, which allow a superficial vein to fill although it is occluded at both ends. Colt [5] has mentioned that during varicose vein operations, bleeding occurs from the communicating veins: these operations were performed with the leg horizontal or slightly elevated, so more elevation is required to stop the flow.

Steubner [6] realised how important it was not to inject a varicose vein with the patient standing, although he used the erect posture for the needle insertion; he devised accordingly a special table to enable the change in posture to be made. His method has serious drawbacks. First, it involves cumbersome apparatus and is therefore unlikely to be widely accepted; secondly, the needle may slip out during the change in position; and thirdly, the limb can only be elevated to the horizontal position.

TECHNIQUE

Having decided that a well-elevated limb is best for injection, it is necessary to have a simple, certain method of producing at first a distended vein for the introduction of the needle, and then a collapsed vein for the injection, with the limb elevated the whole time so that there is no change in position. The basis of the technique is that a pneumatic tourniquet, inflated to a pressure of 180 mm. Hg, is sufficient to occlude all the veins of the lower limb, including the deep ones, so that the superficial veins remain distended when the leg is well elevated.

An ordinary sphygmomanometer is placed on the lower third of the thigh with the patient standing, chiefly on the other foot so that the thigh muscles are relaxed, and the tourniquet is inflated to 180 mm. Hg pressure. He then lies down on a couch, with his chest slightly supported, and the affected leg is raised on a box. The first injection is given at the periphery. When the distended vein has been entered, the pressure in the tourniquet is easily released with the left hand. Before injecting the solution it is advisable to wait until the veins visibly collapse. When the needle is withdrawn it is usual to apply temporary pressure, but it will be observed that the puncture does not bleed as it invariably does when veins are injected in the standing or even horizontal position. The limb should remain raised until an Elastoplast bandage has been applied.

I have found, like many others,[1] that 30 per cent. sodium salicylate solution is the most reliable of the common sclerosing agents, while the very few refractory cases invariably respond to 10 per cent. sodium morrhuate.

RESULTS OF TREATMENT

By this technique the number of injections required to cure a patient has been much diminished, although the dose of 30 per cent. sodium salicylate has been 4–5 c.cm. for an average case. Excessive reactions have, however, been more infrequent and trouble at the site of the injection has become unknown.

By comparing similar cases, I think that injections starting at the periphery with this technique yield better results than internal saphenous vein ligation followed by injections. A cramp-like pain in the leg after salicylate injections is the only real disadvantage, but this is not severe enough to discontinue its use until the discovery of another solution that is painless and as reliable. Fainting occurred in two patients immediately after injection, but an excessive dose was given in one and probably also in the other; both patients were quite fit within five minutes, and they both obtained excellent results. If the injector is afraid of the solution entering the general circulation, and he wishes to use larger doses of solution, the tourniquet can be again quickly inflated to 180 mm. Hg pressure as soon as the veins have collapsed, so that the sclerosing solution is loculated in the veins; this addition to the technique is only required for the largest veins. Slow injection is apparently a sufficient safeguard in the majority of patients, if moderate doses are given.

SUMMARY

(1) The advantages of an "empty vein" technique are stressed. (2) A simple effective technique is described, which I hope will be useful to a wider circle of vein injectors.

I wish to thank the staff of the Liverpool Royal Infirmary for permission to treat their cases, and the successive house surgeons, who have also carried out the technique in a large number of cases.

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RUPTURE OF UTERUS WITHOUT SYMPTOMS

BY I. H. K. STEVENS, M.D., M.R.C.P. Lond.

HON. ASSISTANT PHYSICIAN TO THE KENT AND CANTERBURY HOSPITAL; CONSULTING OBSTETRICIAN TO THE COUNTY BOROUGH, CANTERBURY

IN the following case a woman carried on her normal occupation of housewife for six weeks after rupture of the uterus.

Mrs. B., aged 39 years. It was her seventh pregnancy; five children had been born alive and there had been one miscarriage. The fifth child was delivered by Cæsarean section, which was performed for central placenta prævia on Nov. 23rd, 1929. The last menstrual period in the seventh pregnancy began on March 10th, 1935. The estimated date of birth was, therefore, Dec. 18th–20th, 1935, but no child was then born; some pains were felt, actually between these dates, but they were not very marked and they passed off again. There was no dilatation of the cervix and it was thought by her doctor that there had been a mistake about the dates, as the uterus did not appear to have reached the size of a full term pregnancy. The woman remained at her work as a housewife and was first seen by me on Jan. 30th, 1936, as it was now considered that there was a possibility of post-maturity, even if there had been a mistake of a month in the dates.

On examination the patient did not seem to be in any way unwell. Temperature, 98° F.; pulse, 84; blood pressure, 134/76 mm. Hg. Abdominal examination revealed a pregnancy, by size about 34–36 weeks, and

there was some tenderness on palpation. The fœtus was in the right sacro-anterior breech position. No fœtal movements were observed and no fœtal heart sounds could be heard. On vaginal examination there was a slight reddish-brown sanious discharge, said to have been present since Dec. 20th. The cervix was small and firm; there was no dilatation. No presenting part of the fœtus could be felt, and no definite opinion as to the condition of the body of the uterus could be formed owing to tenderness and rigidity.

The patient was removed to hospital with a view to further investigation and termination of the pregnancy. No satisfactory evidence could be obtained of the previous Cæsarean section, but questions to the patient elicited the fact that the puerperium had been complicated and followed by severe illness. Examination of the urine showed specific gravity 1030. No albumin or other abnormality.

X ray examination confirmed the presence of a fœtus; the report was as follows: presence of fœtus, skull collapsed.

In view of the history it was decided to operate to remove the fœtus and if necessary the uterus.

At *operation*.—The abdomen was opened by Mr. A. B. Beresford-Jones by a subumbilical midline incision. On opening the peritoneal cavity the fœtus was found to be lying free and was removed: the lie was transverse with the head towards the left. The intestines were matted with vernix caseosa. The uterus was about the normal size in a multipara; there was a long rent in the anterior wall of the uterus which was removed by total hysterectomy. There was no blood or organised blood-clot in the peritoneal cavity. The peritoneum was sutured over the vaginal stump and a drainage-tube stitched into the vagina. The abdomen was closed without drainage.

Progress.—After a brief rise of temperature to 100·4° F., on the day following the operation, the patient made an uninterrupted recovery and was discharged in good health.

Examination of fœtus and placenta.—The fœtus was macerated and covered with vernix caseosa. The finger-nails were fully developed and it therefore appeared to be a full term pregnancy; the weight was 4 lb. The placenta was found lightly adherent to the uterus, near the ruptured scar. It was shrunken and thin, 4½ in. in diameter; the total weight with umbilical cord was 7 oz. There was no sign of an extra-uterine attachment.

The uterus had undergone complete involution. There was a rent in the anterior wall, presumably through the scar of the previous Cæsarean section, about three-quarters of the whole length.

In my opinion labour occurred between Dec. 18th and 20th, 1935. During this the uterus ruptured through the old Cæsarean scar and expelled the fœtus and placenta into the peritoneal cavity. This is verified by the condition of the uterus, placenta, and fœtus as well as by the progress of the case as described above. Six weeks later the woman was apparently in normal health, with normal temperature and pulse-rate. She had complained only of slight abdominal discomfort and an intermittent blood-stained discharge. There was no evidence that she had suffered from hæmorrhage or shock and she made a complete recovery from the operation.

SPONTANEOUS SUBLUXATION OF THE ATLANTO-AXIAL JOINT

By Judson T. Chesterman, M.R.C.P. Lond., F.R.C.S. Eng.

SURGICAL REGISTRAR, SHEFFIELD ROYAL HOSPITAL

THIS condition still seems to be of sufficient rarity to report, for I believe only about 25 cases have been placed on record.

Case-history.—The patient was a girl, aged 10, admitted to the Sheffield Royal Hospital on August 4th, 1934, complaining of "stiffness of the neck." She had been perfectly healthy until February, 1934, when during confinement to bed for an attack of acute tonsillitis she developed stiffness of the neck—a condition which had been slowly becoming worse ever since.

Examination.—Positive findings were: head held forward and to the left, also slightly downward, but can be turned to the right with an effort; no tenderness, muscle wasting, or spasm, no glands or tumour felt; limitation of movement of the head upon the shoulders in all directions. Radiography on August 8th showed displacement of the first cervical vertebra on the second (Fig. 1).

Treatment.—For two months the child was kept lying flat with extension applied; afterwards she was sent home with a Jones's collar which was worn for five months. When she was seen on Sept. 27th, 1935, there was no deformity or limitation of movement and she was in perfect health. Radiograms showed satisfactory reduction and calcification (Fig. 2).

Watson Jones[1] points out that the condition is due to hyperæmic decalcification of the atlas, with loosening of the ligaments attaching the odontoid process to the atlas, consequent upon nasopharyngeal or other infection at the base of the skull. Clinically three groups are met with: (1) dislocation with pressure on the medulla causing immediate death; (2) subluxation with pressure on the cord giving rise to quadriplegia; and (3) the common group of which the above is a typical example.

I wish to thank Mr. J. B. Ferguson Wilson for allowing me to report the case and Dr. J. L. Grout for the radiograms.

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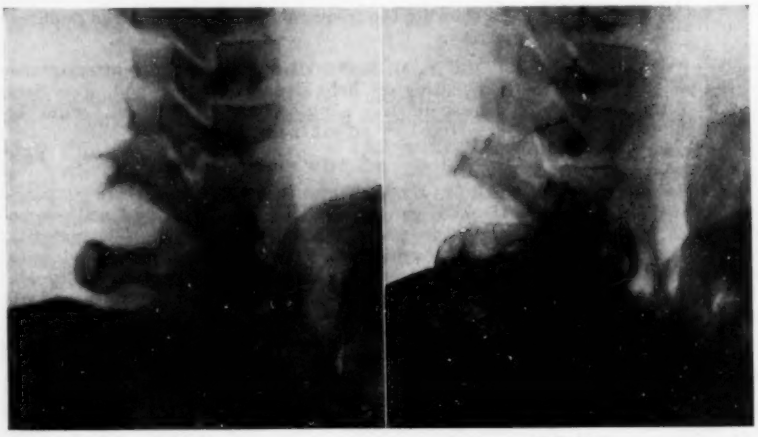

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FIG. 1.—Displacement of first cervical vertebra over the second.
FIG. 2.—Reduction of deformity

[1] Brit. Jour. Surg., 1934, xvi., 30.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF MEDICINE

AT a meeting of this section held on Feb. 25th the chair was taken by Dr. H. MORLEY FLETCHER, vice-president. Dr. G. W. PICKERING opened a discussion on

Obliterative Arterial Disease

as it affects the limbs. The chief clinical types, he said, were thrombo-angiitis, degenerative, senile, and diabetic forms, and embolism—which all affected arteries of any size and caused loss of pulse. Raynaud's disease with necrosis affected small arteries. All these forms except embolism were progressive, but a sudden single attack might occur in small arteries at the extremities in the bilateral gangrene of the young, of the aged, or of paroxysmal hæmoglobinuria. The term "Raynaud's disease" should be restricted to the spasmodic type due to over-reaction to cold in small limb vessels. In severe cases the vessels became progressively obliterated. The outstanding problem was the nature of the factors determining the obliterative process. Only in the vascular complications of cervical rib could the process certainly be arrested. There was no evidence that any form of treatment materially influenced the course of the disease in other types. The condition could be recognised by intermittent claudication: a constant, aching pain felt in a muscle, induced by exercise and nothing else, and relieved by rest. This pain was due to the accumulation of chemical substances which normally were removed by the circulating blood, and might appear in severe anæmia, but otherwise was pathognomonic of structural disease of the vessels. Other diagnostic indications were gangrene (which, in the absence of physical chemical or mechanical destructive agents, was also an absolute indication), absence of arterial pulsation in a warm limb, skin temperature, and the reactive hyperæmia test. The skin temperature was first measured under ordinary environmental conditions, and in obliterative vascular disease the affected limb was cooler than the other. This, however, might be found in other conditions, including hysteria. Any disused limb was likely to be cold. The temperature was measured again after removal of vasomotor tone by spinal or sympathetic nerve block or by warming the body. A difference of several degrees might then be found between the two limbs, and a typical curve was pathognomonic if there were no indication of interference with the sympathetic nervous system. With a little practice a very fair estimate of skin temperature could be made with the hand. The reactive hyperæmia test was in many ways the best, being delicate and simple. The limb was first warmed in a bath, raised to let the blood flow out, and the circulation abruptly stopped with a sphygmomanometer cuff. Then the limb was kept warm in the bath for about five minutes and the cuff abruptly released. In the normal limb or one with spasm the blood flowed rapidly back to the skin. In obliterative vascular disease the skin just below the cuff flushed in three or four seconds; about ten seconds later blood might creep into the calf, and finally, but slowly, to the digits. The test gave an indication of the lowest level for amputation. The blood-flow could be increased by sympathectomy, which was the only permanent method; by vasodilator drugs and heat—which were disappointing; by warming the body; and by suction and pressure therapy. Heating a limb increased metabolism and so might increase blood-need more than blood-flow. Suction and pressure applied alternately seemed to be a promising measure. It gave less satisfactory results in the presence of extreme occlusion, massive gangrene or slough, severe infection or dermatophytosis, and osteomyelitis. The only contra-indications were encapsulated pus and severe infection. The main place of temporary measures lay in tiding over the time between obliteration and the opening up of collateral vessels.

THE SURGEON'S CONTRIBUTION

Prof. J. PATERSON ROSS described experience with this condition at St. Bartholomew's Hospital. The symptoms were different according to whether the obliteration was in the terminal vessels or higher up. In the former case the chief symptoms were pain and gangrene. If the pulse were absent in the dorsalis pedis and posterior tibial arteries the case was usually one of diffuse arterial disease with accompanying obliteration higher up—notably in senile and some diabetic patients. The only treatment was amputation above the knee. When the pulses were present it was a little difficult to understand the lesion. Some of the patients were diabetics. Sometimes there was disease of the popliteal artery insufficient to obliterate it. Surgery should be avoided as long as possible in these cases where only a single toe was affected, and should be as conservative as possible. The pain was sometimes present before gangrene and was an expression of poor nutrition in the skin and subcutaneous tissues. It was relieved by anything which improved nutrition. Sympathetic ganglionectomy was usually successful. Obliteration of the main vessels was associated with intermittent claudication and severe pain in the leg. Lumbar ganglionectomy for claudication gave disappointing results. The pain in the calf might be dramatically sudden in onset and might appear after an apparently successful ganglionectomy. The removal of a thrombosed portion of the artery had been known to relieve it. Arteriography had given accurate information about the vessels, notably in showing the frequency of atheroma in the popliteal artery.

Mr. A. M. BOYD showed a series of arteriograms illustrating the help given by this method. Localised disease of the popliteal artery, he said, could be discovered by no other means.

THE PATHOGENESIS

Prof. H. M. TURNBULL reported on 112 amputations for gangrene, 95 having been done for atheroma and 17 for thrombo-angiitis obliterans. The majority of the atheroma cases had been associated with medial calcification and a few with medial fibrosis. There had been nearly 40 per cent. females, and all the patients had been aged. In the intima there was a great increase of the hyperplastic layer, and some degeneration—sometimes calcification but often fatty atheroma. This increase of the intima could reduce the lumen to a small canal and form a sort of new vessel round it. That alone was often enough to produce gangrene. Total occlusion might be produced by fatty atheroma: imbibition of the intima with lipoid. A commoner way was organisation of

a thrombus. The condition was so widespread that a collateral circulation seemed almost impossible; no healthy arteries were available. In thrombo-angiitis obliterans males were in the great majority; the average age was much younger (31–56), and often the patients were diabetic. There had been no necropsy in this series, and the study of amputated limbs was unsatisfactory. It appeared, however, that the obliteration by organised thrombus began in small arteries and proceeded towards the heart. There was always evidence of inflammation, but this did not imply that inflammation preceded thrombosis. There had been little or no evidence of adventitia inflammation or of intimal cushions as a basis for thrombosis in smaller arteries. In larger vessels the intima showed thickening, vascularity, and a delicate collagenous stroma—an extension of the inflammatory reaction organising the clot. It also showed in most cases large areas of hypertrophy in the popliteal artery and its branches, forming great cushions, but this process did not, probably, give rise to thrombosis by itself. The cushions were degenerate areas of hypertrophied intima, probably formed secondarily to obstruction in the smaller arteries. In two cases there had been endarteritis fibrosa, but no associated thrombosis. The veins showed a focal or general intimal hypertrophy, but that might be an adaptation to a reduced flow and was also seen in the smallest arteries.

DISCUSSION

Dr. PARKES WEBER said that the causes of thrombo-angiitis obliterans were not known. A constant problem was whether or not to stop all use of tobacco; it seemed that smoking played a part and absolute abstention at an early stage might just make the difference.

Dr. OTTO LEYTON found it hard to believe that gangrene was never due to spasm, and quoted a case where spasmodic gangrene had occurred in a diabetic. He recalled successful Symes' amputations for gangrene of the toes, although at the operations no ligatures had been necessary. He doubted whether a pulse were always lost before intermittent claudication.

Dr. J. D. ROLLESTON referred to the rare cases of obliterative disease after infectious fevers. Gangrene of the leg had followed diphtheria in two cases, and fatal double gangrene of the legs had followed measles once in his experience.

SECTION OF UROLOGY

AT a meeting of this section on Feb. 27th, with Mr. R. OGIER WARD, the president, in the chair, a paper on

Horseshoe Kidney

was read by Mr. R. H. O. B. ROBINSON. He said that the incidence of horseshoe kidney in cases of renal disease was 1 in 125. Male patients preponderated over females in the proportion of 8 to 3. The U-shaped mass lay lower than the usual kidney level, and the pelves lay anteriorly because normal rotation could not occur. The mass was heavier than two normal kidneys. Lower pole fusion was commoner than upper pole fusion. In upper pole fusion the suprarenals might also be fused, and this should be borne in mind if extirpation of a part of the kidney was contemplated. There was usually one artery to each half, and one artery to the isthmus. Radiographically the lower renal poles were invisible, the pelves low, and the inferior calices on one or both sides lay internal to the ureter. The minimal basal angle ranged from 60°–90° in the normal radiogram, with an average of 90°. In horseshoe kidney it was reduced, and in his series averaged 57°. The ureters showed a "flower vase" arrangement, each having a slight S-shaped bend so that together they outlined the contours of a vase. Mr. Robinson showed a series of radiograms of the condition, in which the pelves were seen to be low, often elongated, and bizarre in shape, and the reduction of the minimum basal angle was demonstrated. The complications, he said, were obstruction to outflow of urine, with the development of hydronephrosis and pyonephrosis or calculi; or the horseshoe, like the normal kidney, might be involved by tuberculosis or tumour formation. The condition required no treatment per se. In Thompson's 19 cases only 3 showed renal disease. Pain was a fairly common symptom. Abdominal tumour was not a prominent physical sign; statistics showed its presence in 30 per cent. of cases. In performing heminephrectomy the first step was to tap a hydronephrosis or remove calculi if present. Later the kidney could be approached extraperitoneally from the lateral position and the isthmus divided between clamps. Horseshoe kidney was probably comparatively common and could be diagnosed by routine pyelography.

In the discussion which followed, Mr. A. RALPH THOMPSON said that in some cases unilateral kidney was really a variety of horseshoe kidney. In the latter condition the fused kidney was prevented from rising to the normal kidney level by the inferior mesenteric artery; if it did succeed in rising it was forced to go to the left side, and then had the form of a solitary kidney with two ureters. He thought the term "fused kidney," which covered this condition, should be preferred to "horseshoe kidney" which did not.

Mr. F. MCG. LOUGHNANE described a case in which he had divided the isthmus of a horseshoe kidney through a right loin incision, and fixed the right kidney but not the left by nephropexy. Subsequently there was leakage of urine from the right kidney through the wound; this was eventually stopped by diathermising the sinus. He now considered that a second incision should always be made in these cases in order to fix the left kidney as well as the right lest leakage of urine from the left kidney into the tissues should occur and cause disaster.

Mr. H. A. M. WHITBY described a case in which it had been necessary to remove the left half of a horseshoe kidney in a youth of 17; the patient had died of peritonitis on the eighth day.

Sir W. DE COURCY WHEELER had performed heminephrectomy of a tuberculous horseshoe kidney, the anatomical condition being recognised during the operation.

Mr. JOHN EVERIDGE had seen two cases of ruptured horseshoe kidney in one month, and in both he had sutured the ruptures and avoided heminephrectomy. Rupture was probably not an uncommon accident to a horsehoe kidney; a jar on the abdomen might be sufficient to cause it, because the kidneys were fixed by the isthmus. He thought it would be wise nowadays to divide the bridge by endothermy to avoid hæmorrhage.

Mr. T. J. MILLIN contributed a paper on the

Surgical Treatment of Impotence

He said that inability to produce erection might be due to: (1) congenital or acquired abnormalities of the external genitalia; (2) systemic disease; (3) neuro-

pathies; (4) endocrine disorders; (5) neurasthenia; (6) functional causes; or (7) it might be transitory as a result of prolonged abstinence. Three other conditions might be responsible for the disability—namely, trauma of the perineum, inflammation of the perineum, and premature senility (occurring between 40 and 50 years of age). Physiologically erection depended on either psycho-sensorial or cutaneo-motor reflexes, and involved cerebral, lumbar, and sacral nerve centres. Lowsley in New York had experimented by ablation and by plication of the bulbo- and ischio-cavernosus muscles in dogs, and had found that the power of erection was considerably influenced by the action of these muscles. He had then tried the effect plicating these muscles in man. The operation was performed with the patient in the lithotomy position and a bougie was passed into the urethra. The bulbo-cavernosi muscles were plicated and the ischio-cavernosi approximated towards the midline by means of ligatures of chromicised ribbon catgut. In Lowsley's series complete success had followed the operation in 9 cases of 14. In his own series of 8 cases there were 4 complete and 2 partial successes. The cases should be selected and those with a neuropathic history excluded.

Mr. A. E. ROCHE described a case of impotence following rupture of the urethra in which the disability had possibly been of psychological origin.

Mr. WHITBY recalled a patient who had been impotent for 15 years following rupture of the membranous urethra by a shell wound during the war. He had treated this man by diathermy to the spine and rectum, orchitic injections, and suprarenal extract. After two years erection had been re-established.

Mr. THOMPSON quoted cases illustrating that epispadias and hypospadias were not necessarily associated with impotence.

Mr. V. W. DIX wanted to know whether the four successful cases in Mr. Millin's series had been exposed, before operative treatment, to the vigorous influence of Mr. Millin's personality.

Mr. MILLIN replied that the two cases he had treated before operation had both been failures.

The PRESIDENT said he had seen some of Lowsley's work in New York, and believed that Lowsley claimed that the operation was only useful in cases where there was impotence due to injury of the perineum.

A discussion on

Steinach II. Operation for Prostatic Obstruction

was opened by Mr. A. ELLIOT-SMITH, who said that that this operation consisted in bilateral ligature of the efferent ducts of the testicle as they passed to the globus major of the epididymis. Ligature of the vas deferens (Steinach I.) was liable to produce swelling and tenderness of the epididymis, from collection of testicular secretions. The Steinach II. operation occluded the testicular ducts before they reached the epididymis, and the tunica albuginea prevented undue swelling of the body of the testicle. Dr. Paul Niehans, of Clarens, was the first to use this operation for prostatic obstruction.[1] Local anæsthesia was used and a silk ligature was passed round the digital fossa of the epididymis so as to occupy the groove between the globus major and the body of the testicle. Mr. Elliot-Smith had himself performed the operation on 20 cases, but had lost sight of 2 after two and three months respectively. Of the remaining 18 patients, 3 had died and 15 had left hospital with fairly good control of micturition; 2, however, had had a recurrence of prostatic obstruction 8–10 months later and had been treated by prostatectomy. Sixteen patients in the series had been admitted with acute retention, and of these 9 had had persistent retention over periods varying from ten days to five weeks; 5 of these passed urine normally on the day of the operation and the other 4 passed urine on the second, fourth, seventh, and thirteenth day respectively. Two patients in the series were admitted with suprapubic cystostomies. Although normal micturition might begin soon after the operation, it was quite usual for the residual urine to exceed the amount passed naturally for the first week. In the absence of infection, the residual urine of his cases had come down to 1 or 2 oz. over periods varying from one week to five. Difficulty in starting the act of micturition seemed to be abolished once normal micturition had begun. Some degree of frequency might persist. Having examined his old cases, he was convinced that there was a definite decrease in the size of the gland following operation. Thirteen cases in his series of 18 had been relieved by the operation and were still under observation, the periods since operation ranging from one month to eighteen.

[1] See THE LANCET, Feb. 8th, 1936, p. 307.

Mr. H. P. WINSBURY WHITE described a case in which the residual urine had amounted to 18 oz. on the day before operation. Following the operation the patient developed acute retention leading to uræmia. A catheter had been tied in until he had passed the crisis, and the residual urine was now down to 4 oz. and the patient was progressing favourably.

Prof. G. GREY TURNER had seen Mr. Elliot-Smith's cases and had been much impressed. He thought the method deserved thorough trial.—Mr. A. CLIFFORD MORSON asked what was the pathological nature of the prostatic obstruction treated by Mr. Elliot-Smith.

Mr. DIX asked whether there was any advantage in Steinach II. over the Steinach I. operation, in which the vas deferens was ligatured or a part of it was excised. Did ligature of the vas really cause any tenderness of the head of the epididymis?

Mr. EVERIDGE said that patients with incipient prostatic symptoms were beginning to make inquiries about this operation. Some investigation was necessary to find out whether operation on these younger patients was desirable.

Mr. J. G. YATES BELL said that many surgeons ligatured the vas before performing suprapubic cystostomy, as a safeguard against epididymitis. If there was no danger of such infection occurring, Steinach II. might be adopted instead of Steinach I. as a preliminary to the operation.

Mr. JACOBS said he thought that Steinach II. was not suitable in all cases of prostatic obstruction, and described a case in which there had been improvement in frequency following the operation, but in which the residual urine had increased in amount, and suprapubic cystostomy had become necessary owing to the onset of uræmic symptoms.

Mr. S. I. LEVY mentioned two patients who had become more vigorous and active following Steinach II. operations, and also, according to the nurses, younger looking. On the other hand, a patient of 80, on whom he had operated the day before, was now seeing elephants and robbers.

Mr. LOUGHNANE asked what was the effect of the operation on kidney function, and Mr.

E. W. RICHES reminded the meeting that cases of prostatic obstruction often showed fluctuation of symptoms. After an attack of acute retention a patient might remain well for years. The renal function should be thoroughly investigated before and after the operation.

Mr. ROCHE suggested that both Steinach I. and II. might be performed as a preliminary to the suprapubic operation.—DR. HEY remarked that Dr. Niehans claimed that Steinach II. was advantageous in cases of carcinoma of the prostate.

In replying, Mr. ELLIOT-SMITH said that spermatogenesis was believed to be diminished by Steinach II., and that this gave it an advantage over Steinach I. He had seen no epididymitis in his cases but agreed that both operations might be done as a safeguard before a suprapubic cystostomy. He had noticed no mental changes in his patients. All the prostates in his series were large, not small and fibrous. Two, removed post mortem from patients who died, showed a decrease of epithelium and an abundance of the fibrous elements.

MEDICO-LEGAL SOCIETY

AT the meeting of the society held at Manson House, Portland-place, on Feb. 27th, Mr. C. AINSWORTH MITCHELL, D.Sc., the president, being in the chair, Mr. H. W. LINSTEAD read a paper on

Statutory Safeguards against Poisoning

with special reference to the work of the Poisons Board. He said that according to the Registrar-General's report 892 persons died in Great Britain from poisoning in 1934, the average annual number for the last ten years having been 815. He proposed to indicate some of the causes of those deaths, the statutory safeguards provided in the Pharmacy and Poisons Act, 1933, and the recently made rules. Hitherto the duty of deciding what substances should be subjected to statutory control had been vested in the Council of the Pharmaceutical Society, and a Departmental Committee, reporting in 1926, testified to its honourable and distinguished service. But it was thought undesirable that such an important duty should be carried out otherwise than by a Minister responsible to Parliament. The Home Secretary was advised on the rules to be made under the Act by the Poisons Board, who had also prepared the Poisons List. The List and Rules were now before Parliament.

Misuse of poisons, said Mr. Linstead, was classifiable under the three headings: suicide, accident, criminal poisoning other than suicide.

The extent to which *suicide* could be prevented depended on whether it was premeditated or committed because of means readily at hand to carry out a sudden impulse. The Departmental Committee had endeavoured to ascertain whether the easy accessibility of coal-gas caused persons to commit suicide who would not otherwise have done so. In favour of this supposition was the considerable increase of the rate of suicide among females of recent years, the increase being entirely in coal-gas deaths. The Committee were agreed, at any rate, that the publicity given to cases of suicide by poisoning had been the cause of the adoption of this means through suggestion and imitation, and therefore recommended a drastic statutory limitation of the publicity given in newspapers to inquests on suicides. Apart from coal-gas, lysol and hydrochloric acid were most commonly used by suicides in the proportion respectively of 1000, 300, and 90 per year. There were now available less toxic substitutes for the two latter substances: halogenated phenols were coming into use as disinfectants, and non-toxic powders for domestic purposes. It was therefore regrettable that the Home Secretary, against the recommendations of the Poisons Board, had permitted both lysol and hydrochloric acid to be sold by any trader who successfully applied to the local authority to have his name added to the list of poison sellers. Though aspirin had been used as a means of suicide the evidence as to its danger did not seem to warrant the scheduling of this drug as a poison. The Poisons Board had directed attention to the need for greater control over the derivatives of barbituric acid. Each of the many analogues of Veronal had been termed the safe hypnotic, yet each in turn found its way into the statistics of deaths from poisoning. Though fatalities from this group of drugs had increased during recent years the total number was not yet large. For the tighter control of these drugs the new legislation provided that they should be supplied to the public upon medical, dental, or veterinary prescription only, the prescription being valid for one occasion only, unless the prescriber ordered repetition. The new legislation contained few provisions which were likely seriously to decrease the use of poison for suicide, and the greater availability of lysol might be reflected in an increase in the suicide figures from this poison in the coming years.

Accidents were liable to occur wherever poisons were used. For example, halogenated derivatives of carbon, such as carbon tetrachloride and di- and tri-chlorethylene, both widely used as industrial solvents, might have toxic effects. Continual inhalation of these vapours caused toxic jaundice. The Poisons Board had suggested that it might be desirable to require the labelling of the containers of these substances with a warning of the character of the contents, and the precautions to be taken in using. The manufacture of pharmaceutical preparations containing poisons had nowadays to be undertaken by or under the supervision of a pharmacist, a member of the Institute of Chemistry, or a person who for a period of three years before the Rules came into operation had been continuously engaged in the manufacture of such preparations. Certain biological products were allowed to be manufactured by or under the supervision of a medical practitioner. In the past, accidents had occurred due to the sale of such substances as solutions of ammonia, hydrochloric acid, and disinfectants in sauce bottles, whisky bottles, and even milk jugs by traders who kept no poison bottles; this led the Poisons Board to recommend that listed sellers of Part II. poisons should be required to sell those poisons in sealed containers as sealed by the manufacturer. However, the value of this recommendation had been weakened by a modification permitting solutions of ammonia, hydrochloric acid, and salts of lemon to be packed by the listed seller.

The compounding of medicine containing poison was restricted to hospitals, pharmacies, and medical practitioners' establishments. Any person, however small his pharmaceutical knowledge, was allowed to open a shop and undertake the dispensing of medical prescriptions. Nor had we in this country, said Mr. Linstead, adopted the precaution against accidents which existed in most countries on the continent, the reservation to the medical

practitioner of prescribing and to the pharmacist of dispensing. In Scotland there was a convention whereby the medical practitioner did not supply his own medicines. Little could be done by legislation to prevent accidents from poisons occurring in the home; except by labelling and a distinctive shape of a bottle containing poison. The too frequent use of the word "poison," particularly when applied to substances not highly toxic, diminished the cautionary value of the word. For medicine to be taken internally the following words might be substituted: "Caution; it is dangerous to exceed the stated dose." Mr. Linstead quoted one case in which a poison was bought in a poison bottle, but was turned into a milk jug so that the bottle could be returned and the deposit refunded. In another case a fowl was destroyed by strychnine in order to destroy a neighbouring fox; but a farm labourer found the fowl and took it home for the family dinner. The carrying of poisons by railway was carefully regulated to prevent leakage, but, so far, no parallel regulations had existed for carriage by road. Rules to fill this gap had now been made. No general provision was found to be practicable for the more ready identification of poisons.

Two circumstances contributed to accidental poisoning from substances designed for medical purposes, perhaps on medical advice: (1) the idiosyncrasy of individual patients, and (2) the taking for long periods of poisons which had a cumulative effect. The Board had to consider a number of poisons which were known to have caused death or serious impairment of health when taken in medicinal doses. The effect of regular ingestion of acetanilide in producing toxic jaundice had long been recognised, and its use as an ingredient in proprietary medicines had now been checked by including it in Part I. of the Poisons List. Attention was also directed to the part played by pyramidon in producing agranulocytic angina; the Board had imposed a restriction limiting the supply of this drug to a medical prescription, so barring its use in proprietary medicines. The nitrophenols and nitrocresols were liable to produce untoward results, even in medicinal doses, unless the basal metabolic rate of the patient was regularly determined. At least one death had occurred in this country from using such a preparation for slimming purposes. Under the Poisons Rules these preparations might be supplied to the public upon medical prescription only, and steps had been taken to acquaint practitioners with the precautions necessary in the administration of these drugs.

Turning to the use of poisons for *criminal purposes*, Mr. Linstead said that one of the principal objects of the new legislation, as of the old, was to prevent the use of poison for murder, or, at the worst, to facilitate the detection of the murderer. It sought to do this by making the poison difficult to obtain, and the transaction easier to trace by means of a record kept by the seller, and by the label placed on the container. Such poisons as arsenious oxide were now surrounded by numerous restrictions. The registration of all pharmacies by the Pharmaceutical Society and the listing of premises of sellers of Part II. poisons by local authorities would do much to facilitate the task of the police in tracing the supply of a poison by circumscribing the scope of their inquiries. The progressive increase in the delicacy of methods of chemical analysis rendered it very difficult now for a poison used for crime to escape detection. Among the legal aspects of the question was a substantial increase in penalties, though the maximum fines imposed were not excessive in comparison with those prescribed in similar modern statutes. The rule-making powers conferred upon the Secretary of State by Section 23 of the Pharmacy and Poisons Act, 1933, were very wide, and were such as to discourage any except the most enthusiastic litigant from taking a case to appeal, since any decision could soon be invalidated by a modification in the rules.

DISCUSSION

Sir WILLIAM WILLCOX said that the report of the Poisons Board represented an upheaval of the pre-existing conditions, and it remained to be seen how the new enactments would answer in practice. Some difficulties were to be expected at first. The recommendations of the Board had not been followed implicitly, as some of the enactments had been modified by the Home Secretary. He agreed that the possibility of purchasing lysol and hydrochloric acid from a person who knew nothing of poisons was a danger. One of the great steps forward taken by the Board was in placing under control drugs which on account of their toxic action ought to be dispensable by only medical men and pharmacists. Barbiturates had hitherto been easily obtainable, and yet they were undoubtedly drugs of addiction. The ordinary person was not in danger of becoming an addict, but the neurotic and unstable was very liable to do so. A further important point was that the prescription for these drugs would in future be retained by the dispenser; if the patient was allowed to keep the prescription the restrictive clause would be largely cancelled, as he could run round to various chemists with it and so lay in a good stock. If there was need to repeat the dose, the number of repetitions must be stated, and the pharmacist should register the details. Australia several years ago adopted regulations restricting the use of drugs of the veronal group, though so far they had not stipulated that the pharmacist must retain the prescription. Drugs which had received special attention included the atophan group, which caused toxic jaundice. He was glad to know that in future strychnine was to be prohibited for the purpose of destroying animals; it would be interesting to see whether the substitutes for this purpose would prove efficient.

Dr. JUDAH JONA (Melbourne) said that in Australia the pharmacist was not required to retain the prescription containing a dangerous drug but to cancel it with a large-lettered rubber stamp, so that there was no chance of it being repeated without authority. Patients liked to retain it as a memento of the fee paid to the doctor. Though there were safeguards against repetition, there were none against purchasing large quantities at a single time. He suggested that the time had arrived for an "honest advertisement" Act, a matter in which he would like to see Great Britain take the lead.

Mr. R. L. COLLETT, F.I.C., said one of the difficulties in connexion with this legislation was that the substances concerned were important products, apart from being poisons; they were used in industry in large quantities, also in research and in analytical work. The problem of the Poisons Board had been complicated by the difficulty of ensuring adequate protection to the public without imposing excessive restrictions upon industry and the practice of the sciences. His own experience of the leather industry ten years ago was that of seeing men shovel red arsenic into vats of lime and soda with a wooden spade; those substances were lying on the floor

of the tannery. He congratulated the Board on the reasonable spirit with which they had removed noxious restrictions from industry while safeguarding the public. It was easier to get a rule altered if experience showed it was inadvisable than to establish the restriction in the first place.

Mr. H. E. CHAPMAN said a year or two must elapse before it would be known whether the present system of control would be more effective than that previously in force.

Mr. F. BULLOCH, D.Ph., was glad that the Poisons Board and the Home Secretary did not see eye to eye over some of the enactments. The Board recommended that poisons used for animal medicines and sold as proprietary medicines should be limited to a certain series of poisons; but now, through the action of the Home Secretary, that limitation had been suddenly withdrawn and so the whole gamut of poisons was open to animal medicine manufacturers.

Prof. J. G. WRIGHT (Royal Veterinary College) said that no member of the veterinary profession had a seat on the Poisons Board. He congratulated the Board on their decision regarding the use of poisonous substances in vermin beds; he protested against the use of poison baits which had been indiscriminately laid. Dispatching animals by arsenic and phosphorus meant a miserable death. Morphine was largely used by the veterinarian as a pain reliever, as also was cocaine, which drug had such a more sedative action on the dog's cornea than did any other.

The PRESIDENT thought that if the Poisons Board could be invested with more power than at present, many of the existing difficulties would disappear. As an instance, meta fuel, which had been investigated by Sir William Willcox, Dr. Cox, and himself, ought to be labelled as a poison. It was used in the cinema industry for producing an impression of snowstorms, and was sold in small boxes, looking like sweets, which could be purchased by anybody. It had been eaten as a sweet by accident.

Mr. LINSTEAD, in reply, said an attempt had been made to get over the formula on the bottle difficulty by requiring disclosure of the usual scientific name on the bottle or packet. He had been glad to learn that strychnine was not necessary as a vermin killer.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

THE maternity and child welfare group of this society held a meeting in London on Feb. 21st with Dr. G. C. M. M'GONIGLE (Stockton-on-Tees) in the chair.

Prevention of Maternal Mortality: the Rochdale Experiment

Dr. ANDREW TOPPING (senior medical officer, London County Council; late M.O.H. for Rochdale) read a paper entitled Some Factors in Maternal Mortality with special reference to the part played by Publicity in its Prevention. He began by explaining the alarm and dissatisfaction expressed by the public at the continued high maternal mortality-rate as the psychological reaction to the death of a mother in childbirth, and pointed out that there were other conditions—e.g., diphtheria and acute appendicitis—in which lives were lost in an equally unnecessary manner without arousing any comparable public feeling. In the present situation however there were certain redeeming features, and it should be noted in the first place that the method of reckoning the rate was in several ways fallacious. Clearly the basis of the rate should be the total pregnancies, and since this was not taken as the basis, and varying factors such as the increase in abortion and the decrease in fertility were not comprehended in it, comparisons both with the past and with other countries were misleading. If these considerations were taken into account the place of this country in the international standard of obstetric efficiency would be near the top instead of, as at present, about half-way up. Again, all recent reports had emphasised that about half the maternal deaths were avoidable, but this classification into "avoidability" was unsatisfactory because, for example, the fatal case of eclampsia which had received no antenatal care was classed as an avoidable death, whereas it was well known that eclampsia occasionally might arise despite every precaution. It was also noteworthy that this basis of 50 per cent. of avoidable deaths was largely taken from areas in which the maternal mortality-rate was high. In areas in which the rate was low far less than 50 per cent. were avoidable.

When he had first taken up antenatal work in a metropolitan borough Dr. Topping had been struck by the intense interest taken by pregnant women in their condition, and had found them eager to coöperate if the reasons for their coöperation were intelligently explained. When he moved to Lancashire he found that the health visitors employed by the Lancashire county council were exceedingly good and careful in instructing the mothers in the various practical details of the hygiene of pregnancy and confinement. At Rochdale the maternal mortality-rate was much higher than in the surrounding districts in which the Lancashire health visitors worked, and in fact it had been for some years the highest in England. His first task was to interview the practitioners, many of whom he had come to know personally, and from these he received many suggestions about possible causes of the high rate, such as rickets, malnutrition, and industrial work. A study of the forms of investigation into maternal deaths convinced him, however, that none of these reasons held good and that the two main factors were lack of antenatal care and unnecessary interference.

The first step in the campaign was to hold a meeting of the medical, social, and religious bodies in the area. There was a large attendance, aided perhaps by the provision of a dinner by a generous supporter, and a publicity campaign was decided upon. Numerous meetings were then held averaging about twice weekly, addressed by Dr. Topping himself, his maternity and child welfare medical officer or other doctors. No alarming propaganda was indulged in and it was emphasised that pregnancy was a normal natural condition which was perfectly safe if the mother did her share. Mothers were urged to accept antenatal care, to report the slightest abnormality at once, and to accept in-patient treatment if recommended. They were told that half the maternal deaths were preventable and that the rate in Rochdale could quite easily be lowered. Pamphlets were distributed in which the main causes of death and how to avoid them were simply explained—i.e., disproportion, abnormal presentation, "kidney weakness," and puerperal fever. "Don't listen to grandmother but visit our antenatal clinic and give yourself and your unborn baby a square deal" was the sort of slogan used. The local newspaper

gave valuable help by printing everything submitted by the health department in exactly the form in which it was received and without scare headlines. The local medical and midwives associations coöperated handsomely, and without their help the scheme would have been unworkable.

At the same time certain improvements and enlargements were made in the antenatal clinics. A few criticisms of the work at these clinics were heard, the usual one being that the medical staff of the clinics took no share in the actual confinement. This was dealt with by publicity suggesting that the criticisms would be more valid if their authors performed their antenatal work properly, and the criticism was also partly met by sending a full report of the antenatal examination to the doctor or midwife concerned whether any abnormality was found or not. On the reverse side of the form of report was a space for the details of labour and puerperium to be noted and returned to the public health department. Other steps taken were the appointment of a consultant, the provision of a unit for puerperal sepsis, and the drawing up of plans for a new maternity home. In addition the ten best midwives in the town were guaranteed an income a very little more than their previous average income, and telephones were installed in their houses; this ensured their coöperation, gave them a definite status, and softened their regret if one of their cases was admitted to hospital. Nearly all these measures, said Dr. Topping, had been taken by most boroughs, although sometimes the letter rather than the spirit of the recommendations had been carried out. The only difference in Rochdale lay in the intense propaganda; for example, the mothers quickly came to know what a real antenatal examination connoted and any doctor or midwife who scamped it was very soon talked about very much to his or her disadvantage. Again, the pressure to interfere from the patients and their relatives was enormously reduced and the routine use of forceps fell very greatly.

The publicity campaign was begun in 1931. The average maternal mortality-rate for the four years 1928–31 was 9·0 per thousand; for the four years 1932–35 it was 3·0 per thousand (1·75 in 1935); and it was, therefore, fairly safe to conclude that these results were due to the campaign. Propaganda based on the truth could do nothing but good. The secret was complete honesty: "tell the mothers why they should do what is wanted and they will do it."

FACTORS IN MORTALITY

Responsibility for maternal deaths might lie with any one or more persons—e.g., the patient, the midwife, the doctor, the hospital, or the local authority. As far as the patient is concerned certain factors were not her fault, so to speak, and comparisons between different areas might therefore be fallacious. For example, he had lately been investigating the reasons for the differing rates in the East End and West End of London and had found that the proportion of primigravidæ and the age of the first pregnancy were higher in the West End. Another factor was the variation in the illegitimacy rates, it being known that the maternal mortality for illegitimate births was considerably greater than that for legitimate. Again, hospital accommodation clearly varied enormously, and the figures of various hospitals and organisations were not necessarily comparable, largely because of the selection of cases.

As far as the patient was concerned the apportionment of blame was very difficult. The fact of pregnancy was still often concealed, sometimes because of a false feeling of shame and sometimes because it was hoped that a successful abortion or miscarriage might be managed. The increase of abortion of recent years was very serious; according to a recent article by Dr. Parish of St. Giles's hospital, the number had quadrupled in the last five years. Of 1000 patients admitted (half of whom were infected) 485 admitted instrumental interference, 111 admitted to the use of drugs, and 9 admitted that they had been to a criminal abortionist. He thought that it was not so much poverty as the desire of young couples not to restrict their amusements which was leading to this increase.

Of midwives there were two opposite types which did harm: (1) the kind who thought she knew everything and deprecated bringing in medical assistance even when necessary; and (2) the nervous kind who frightened her patient, sent for the doctor unnecessarily, and urged him to interfere. The problem of the doctor, however, presented the greatest difficulty. The training he received was lamentably inadequate at most schools, and the average man went into practice with no real practical experience. Many were extremely competent, but it was idle to deny that deaths were often directly due to lack of knowledge, errors of judgment, carelessness, hurry, or unwillingness to call in expert assistance. Though there was, and must be, an important place for general practitioners in any midwifery service it must be ensured that all who undertake the work are keen and competent. In spite of everything that so many authorities had said concerning droplet infection it was rare to find a doctor who would wear a mask. Every public health officer who had the task of investigating maternal deaths could quote not one but several cases in which a shocking ignorance or carelessness had apparently been displayed, and one of his councillors had actually proposed that a coroner's inquest should be held on every maternal death. Such a procedure, Dr. Topping thought, would do a great deal of good, but would lead to more trouble than was justified. The consultant, also, might share the responsibility for failure. Some were too prone to interfere unnecessarily; they felt that they had not justified their existence unless they displayed some tour de force. Her eagain public knowledge of the facts would be useful, for it would prevent women from thinking that the consultant got his money for nothing if he adopted a policy of masterly inactivity. Many consultants had been remiss in not emphasising the part played by bad midwifery in the causation of maternal deaths.

Finally there were ways in which the voluntary hospital or local authority might fail in their duties. It was freely admitted that some municipal hospitals were not so good as others, but rare to hear any voluntary hospital referred to as anything less than a cross between, say, Guy's and the Edinburgh Royal. But any hospital must be at fault if it purported to deal with maternity cases and fell short of accepted standards. Among local authorities many fulfilled recommendations in the letter, but not in the spirit. Their hospitals, too, might be inadequate; their antenatal clinics might not offer the requisite comfort and privacy, and the experience and qualifications of the medical officer in charge might not command the respect of practitioners. There should be continuity between antenatal and in-patient departments; there should be a self-contained pyrexia unit; the consultant should be an accepted authority,

and practitioners should not be openly or tacitly discouraged from making full use of his services. The medical officer of health was gravely at fault if he did not do his utmost to get his committee to do more than the minimum, and was to be pitied whether blameworthy or not, if his relations with practitioners were not cordial.

DISCUSSION

Dr. E. H. T. NASH (Heston and Isleworth) inquired whether there had been any difference in unemployment over the period in question in Rochdale. He asked because of the remarkable effects of the giving of milk in the Rhondda Valley which were especially evident during a nine months' strike when the women were properly fed for the first time from voluntary sources.

Dr. DUNSTAN BREWER (Swindon) found that even in an area in which the rate was low many deaths were still preventable though, of course, there was an irreducible minimum. He quoted a case in which the urine and blood pressure had been examined at 9 A.M. and found to be normal and the woman was having an eclamptic fit at 4 P.M. As far as statistics were concerned Dr. Brewer thought that the only possible basis was the convention adopted in New South Wales under which every death in a woman between the ages of 15 and 45 is considered to be a maternal death unless proved to the contrary. A scrutiny of all such deaths resulted in the true maternal mortality-rate in his area being always double that returned by the Registrar-General; for example, an inquiry into the death of a young woman from "myocarditis" revealed that a post-mortem had demonstrated a knitting needle in the peritoneum. Such an inquiry was only possible, unfortunately, in the smaller boroughs. The age at primiparity was important as was shown by the recent Canadian report. Dr. Brewer doubted whether the increase in abortions was genuine; might it not be due merely to lessened concealment and increased hospitalisation? On the other hand, he was certain that the art of obstetrics had degenerated in recent years.

The CHAIRMAN (Dr. M'Gonigle) wondered whether a too liberal interpretation of the Central Midwives Board rules for sending for medical aid by midwives was leading to harm through interference in normal cases. In some cases there was undoubtedly dichotomy between midwives and doctors.

In reply, Dr. TOPPING said that the incidence of unemployment had not varied in Rochdale during the period under discussion: in any case it was not the poor mother who died. He too had been impressed by the results of the Rhondda milk experiment, but he understood that a propaganda campaign had been initiated at the same time. His main contention, he said, was that once the true facts were known public opinion would be so strong that improvements would follow in all branches of the service whatever the cost. Undoubtedly, in his opinion, the time had come to speak the truth and shame the devil. Let the blame go where it belonged: to a careless public, an inefficient midwife, an inept doctor, or a badly run health department.

KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. On Feb. 14th Lady Davis opened the new buildings at this hospital at Maidstone. The president, Sir Edmund Davis, and Mr. E. W. Meyerstein have promised to give £2000 towards the extensions, but there still remains a debt of £3000.

LIVERPOOL MEDICAL INSTITUTION

AT a pathological meeting of this institution on Feb. 20th, with Dr. E. GILBERT BARK, vice-president, in the chair, a paper on

Bacteriological Aspects of Puerperal Sepsis

was read by Prof. HEDLEY WRIGHT. The term puerperal fever, he said, was not synonymous with puerperal sepsis in the narrower sense, for in a series of 125 cases of fever in the puerperium it was found that only 48 were due to infection of the genital tract. Of these only 14 were due to hæmolytic streptococci and 10 were attributed to anaerobic streptococci. The occurrence of fever in the puerperium called for full clinical and bacteriological examination of the patient. But severe sepsis was most commonly due to hæmolytic streptococci, although as Colebrook had shown a not inconsiderable proportion of cases was due to anaerobic streptococci. In hæmolytic streptococcal infections blood cultures were negative in some 74 per cent. of cases and where positive the numbers present were usually small (less than one organism per c.cm. to 1000 per c.cm.) according to Hare, and comparable with the numbers found in infective endocarditis and other bacteriæmias. The blood infection was, therefore, to be regarded as a minor feature in the disease. There was sufficient evidence to indicate that the hæmolytic streptococci which caused this condition were not derived from among the normal inhabitants of the genital tract. Where such organisms had been found in the vagina before delivery the puerperium had followed an uneventful course. This was because the normal inhabitants were serologically and biologically distinct from the strains which were pathogenic for man; these fell into one large group which could be subdivided into a large number of types. This particular group had been found almost exclusively in the respiratory tract of normal human beings, the fæces of patients suffering from an infection of the upper respiratory tract, and on the hands of some normal persons. That the respiratory tract was the main source of infection in the puerperium was therefore to be expected, and in 103 cases reported by various authors 99 had actually been traced to such a source, 79 to some person in attendance and 20 to the patient's own throat or nose. Specific treatment with the sera available appeared to be completely useless, and it was possible that this was in part due to the difficulty of obtaining a serum adapted to the particular infecting strain, though more probably to the fact that recovery from infections of this kind was largely influenced by incompletely recognised factors within the local focus of infection in the genital tract.

In the discussion which followed, Dr. H. H. MACWILLIAM said that in the acute and severe cases of puerperal septicæmia there was very little localisation of the infection. He regarded thrombosis in the veins as an important factor in limiting spread. In these acute cases the vessels in the placental site did not show the clotting found in this situation in patients who had died from some other cause. When thrombosis occurred in the iliac veins the prognosis was relatively favourable and it was likely that thrombosis was very much more common in the ovarian veins than is suspected. Antimicrobic serum was useless, but Dr. MacWilliam thought that under certain conditions antitoxic serum, probably by supplying complement, was one of the most effective

agents we possess. Until recently the experience at Walton Hospital, Liverpool, was that if a good growth of hæmolytic streptococci was obtained from the blood in a broth medium by simple technique the patient nearly always died. About two years ago treatment with human serum was adopted, and since then the recovery-rate had been quite high.

MIDLAND MEDICAL SOCIETY

AT a meeting of this society held at Birmingham on Feb. 5th, with Prof. W. H. WYNN, the president, in the chair, a paper on

Diverticulitis of the Colon

was read by Prof. SEYMOUR BARLING. He thought the condition was due to weakness at certain points in the bowel between the longitudinal bands, associated with abnormal stresses in the large bowel. This weakness he attributed to previous inflammation. The term "prediverticular state" he considered a misnomer, for he had seen a patient in the so-called prediverticular phase, with four years' symptoms, in whom at laparotomy temporary diverticula could be seen whenever the bowel was in spasm. In such a case diverticula had already formed. Another patient had died of ulcerative colitis, the musculature being involved in inflammation from the mucous membrane; and though the X ray picture was that of the "prediverticular state" no diverticula were present post mortem. There was a type with fibrosis and narrowing of the bowel wall, apparently due to inflammation and fibrosis strengthening instead of weakening the muscle-fibres, the diverticula being apparently incidental in some cases. Diverticulosis—where fully developed diverticula were present—was slowly progressive, but the symptoms were of a minor character and seldom necessitated operation. Cases with secondary infection were the ones usually seen by the surgeon and represented the true diverticulitis; the patients were mostly over 60 and it was the result of slowly progressive changes which might be overlooked in the early stages. Initial pain might be slight or severe; a tender colon might be palpable in the left iliac fossa and occasionally severe hæmorrhage was a sign—it had occurred in 3 cases out of the speaker's series of 28. Obstruction was not uncommon and might occasionally be due to carcinoma superimposed on the diverticular disease. Prof. Barling had had 5 cases with carcinoma out of 28. Early cases required medical treatment and surgery was needed chiefly for obstruction, spreading sepsis, or fistula. The disease was not the surgical curiosity it was considered to be and had to be kept in mind when an abdominal condition presented itself.

Dr. T. L. HARDY asked if any useful purpose was served by the term "diverticulosis." It suggested an active morbid process associated with symptoms, but many authorities did not regard it as such. Diverticula were present in about 5 per cent. of patients over the age of forty, a figure obtained by Rankin and Brown at the Mayo Clinic from 24,620 radiological examinations of the colon and 1925 post-mortem examinations. Whether uncomplicated diverticula ever of themselves gave rise to symptoms was debatable, his own view being that the symptoms complained of at that stage were due to an associated disturbance of bowel function, accidental rather than incidental to the diverticula. Dr. Hardy's personal experience of diverticulitis was, he said, small, and he had records of only 22 cases (16 men and 6 women) in the past six years. He agreed with Prof. Barling that diverticula were largely manifestations of wear and tear; they showed themselves usually in the degenerative or decrescent period of life, the average age in his series being 58. Of his 22 patients 14 were noted as being obese and flabby. He did not think it need be assumed that spasm played an important part in the formation of diverticula, or that sympathetic or parasympathetic and endocrine influences were necessarily responsible; for neither true colon spasm, a much more common disorder, nor the various forms of colitis led to the formation of diverticula. The dangerous potentialities of diverticula needed no emphasis. According to Rankin, in about 15 per cent. of cases they became inflamed and gave rise to symptoms, the remainder being discovered accidentally. By their shape and feeble musculature, retention of fæcal material was encouraged, and the way to subsequent infection and diverticulitis laid open. The physician saw these cases for one or more groups of symptoms—disturbance in the normal routine of bowel movement, abdominal pain, local or regional colitis, or vague ill-health associated with fever, shivering, and leucocytosis. Treatment took the form of what was somewhat euphemistically called "colon hygiene," and was as necessary, as a protective measure, where diverticula have been discovered accidentally as it was in established diverticulitis. At first, and whenever acute symptoms were evident, a bland diet of cereals, milk, eggs, and fish was desirable, with a period of rest in bed. Later, a full, well-balanced diet might be planned, though some loss of weight should usually be aimed at. Roughage must be always avoided and soft vegetables should be passed through a sieve. The bowels needed scrupulously careful regulation to avoid extremes; soft, semi-formed stools should be aimed at, but any form of irritating aperient was absolutely contra-indicated. Rectal irrigation, if carefully given through tube and funnel at a pressure of certainly not more than 18 in. and limited to one pint, was occasionally valuable, especially where there was acute pelvic inflammation. An occasional enema of warm olive oil up to 6 oz., given over-night and retained till the morning, might also be used as a routine once a week or at longer intervals. Belladonna and hyoscyamus were certainly valuable in relieving the spasm and pain associated with diverticulitis. The mode of life should be one of all-round moderation; exercise in the form of walking, golf, shooting, and riding was good. A system of general massage and graduated abdominal exercises such as were embodied in the term "abdominal culture" were useful. Abdominal massage, however, was an appalling blunder, and Dr. Hardy had seen it precipitate an attack of subacute obstruction. A well-fitting belt to maintain intra-abdominal pressure was desirable when there was much protrusion.

Dr. HAROLD BLACK said that of 432 patients examined by barium enema in 1934, 68 showed diverticula (36 men and 32 women). He thought that few of those with diverticula developed diverticulitis, and mentioned that 15 per cent. of cases with carcinoma of the colon showed diverticula. It must be remembered that radiological abnormalities were not necessarily the cause of the patient's symptoms; one patient had numerous diverticula but the symptoms were later shown to be due to a ureteral calculus. Dr. Black thought the inflammatory bowel wall changes might be a result of the diverticula rather

than their cause, and that a degenerative change in the musculature of the bowel was a precursor.

Dr. J. F. BRAILSFORD did not think that diverticulitis was a contributory factor in carcinoma coli. Any association of the two diseases was probably accidental.

The PRESIDENT asked whether the condition might not be a disease of civilisation. Was the colon undergoing atrophy? What were the possible causative dietetic factors? He did not believe that inflammation was the cause of diverticula, but held that irregular bowel contractions were possibly concerned. He had seen two cases of plumbism with diverticula present.

PATHOLOGICAL SOCIETY OF MANCHESTER

AT a meeting of this society on Feb. 12th Prof. S. L. BAKER and Dr. J. CRIGHTON BRAMWELL read papers on the

Pathology of Heart Disease

Prof. BAKER pointed out that inflammatory lesions in the myocardium itself appear to play little part in the production of myocardial failure. Vascular lesions due to coronary obstruction, atheromatous or syphilitic, were the chief cause of gross myocardial lesions. The development of a collateral circulation by anastomoses between coronary branches and pericardial branches from extracardiac thoracic vessels could modify the effects of coronary occlusion, particularly if this occlusion was gradual. Cases of complete obliteration of both coronary orifices by syphilitic disease had been reported; here the heart was supplied for a time entirely by such collaterals. Most workers at the present time believed that angina pectoris was produced by anoxæmia of the myocardium; it was usually, though not always, associated with coronary narrowing.

Cases of cardiac failure with myocardial hypertrophy formed an important group; such failure often occurred apart from valvular lesions in persons with hypertension. A proportion of such cases showed coronary athero-sclerosis, but there were many without coronary obstruction in which, apart from hypertrophy, the myocardium showed no appreciable pathological change. The cause of myocardial failure in such hearts was a matter for speculation. There seemed a probability that the vascular supply failed to keep pace with the greatly increased bulk of hard-worked muscular tissue. Karsner and his co-workers had shown that in cardiac hypertrophy there was no appreciable increase in the number of muscle-fibres but a great increase in the mean diameter of each fibre. Unless the number of capillaries per muscle-fibre was greatly increased such hypertrophied fibres would be inadequately supplied with blood. No one had as yet investigated the problem from this point of view.

Summing up the pathology of myocardial failure, it could be said that, excluding acute toxic effects, factors interfering with the blood-supply, and certain rare cases of lesions of the conducting system, there remained a large group of cases of myocardial failure without adequate pathological findings. Here one had to assume that there was functional damage from overwork and possibly a failure of the blood-supply to keep pace with the demands of the hypertrophied and heavily worked muscle-fibres.

Dr. CRIGHTON BRAMWELL, after reviewing the changes which had taken place in the outlook on cardiology during the past fifty years, suggested that patients complaining of cardiac symptoms might be classified in three groups: (1) those with heart disease, (2) those with neuro-circulatory asthenia, and (3) those in whom symptoms were attributable to an anxiety neurosis. The first group consisted of inflammatory, degenerative, and other lesions of the heart itself, while in the second group the cardiac manifestations were secondary to such conditions as focal sepsis or disease in other parts of the body. Heart disease, neuro-circulatory asthenia, and anxiety neurosis might all be present in the same patient; in fact it was rare to meet with a case of heart disease in which there was not some element of neurosis.

REVIEWS AND NOTICES OF BOOKS

Localized Rarefying Conditions of Bone

By E. S. J. KING, M.D., D.Sc., M.S. Melb., F.R.C.S. Eng., F.R.A.C.S., Honorary Surgeon to Outpatients, Melbourne Hospital; Stewart Lecturer in Pathology, University of Melbourne. London: Edward Arnold and Co. 1935. Pp. 400. 35*s*.

ONE of the most fascinating features of medicine is the appearance, waxing, and waning of certain morbid conditions as centres of interest and attention. The interest aroused by particular diseases or injuries varies enormously from one decade to another quite independently of their prevalence. At the moment anything labelled "osteochondritis" evokes a prompt response from orthopædic surgeons, and the issue of a complete guide book to this maze of conditions is therefore timely. The initial and greatest difficulty is one of nomenclature: the G.O.M. of the osteochondritides (though not the first to be described) has been christened no fewer than fifteen times, and it is to be hoped that the name selected by Mr. King, "osteochondritis of the upper epiphysis of the femur," will now be accepted as the official title, if only for the sake of simplicity.

In this work the author has brought together all that is known about the various forms of osteochondritis and certain types of bone atrophy. His command of the vast literature on the subject is so complete that the reader must be on guard lest he should overlook the author's own useful contributions. There is hardly an epiphysis in the body that has not been the site of an osteochondritis, and Mr. King has been vigilant in collecting references to all the forms of it, however rare. Legg-Perthes' disease and Osgood-Schlatter's disease are not typically "rarefying conditions of bone" and have little relation, as the author shows (p. 291), with Kümmell's disease and its allies which are. All the same, a most useful service has been rendered in bringing together both groups of these puzzling conditions, and this book will almost certainly be a standard work of reference for many years to come. The first section deals with bone as a tissue, radiographic appearances, and certain anatomical features; the second describes every known form of osteochondritis. It is exasperating that, despite the efforts of Mr. King to lay before us all that is known, we are still very much in the dark about the ætiology and pathology of this type of bone disease. Good functional recovery so frequently follows conservative treatment that conscientious surgeons have had little opportunity of obtaining pathological material, and experimental

work has, for the most part, given little help. Various forms of bone atrophy, in which trauma plays a definite part, are described in Section III., and here again the exact causation is a matter for speculation. An excellent account of osteochondritis dissecans completes this work for which (apart from an X ray reproduced upside down on p. 287) we having nothing but praise.

The title of the book is not of the author's choosing; it was the subject set for the Jacksonian Prize of the R.C.S. for 1933, which distinction Mr. King won.

Bacteriology of Typhoid,

Salmonella, and Dysentery Infections and Carrier States. By LEON C. HAVENS, M.D., Director of Laboratories, Alabama Department of Public Health. New York: The Commonwealth Fund; London: Humphrey Milford, Oxford University Press. 1935. Pp. 158. 7*s.* 6*d.*

Now that the enteric fevers have become an intermittent rather than a continuous problem in this country a book by an enthusiastic worker with long experience of an endemic zone is particularly valuable. The late Dr. L. C. Havens was director of laboratories to the Alabama Department of Health, and in this little book he has given us the fruits of his experience in a clear and attractive form. The manual is essentially practical, but certain theoretical matters such as the different antigens of the typhoid-salmonella group are simply and adequately discussed. Stress is laid on the fallacious nature of a purely serological diagnosis of the enteric infections. The author points out that it should be possible to isolate the causative organism in a large percentage of cases, and he devotes a good deal of attention to the methods by which this can be done. The description of salmonella infections is apposite, and the subject has been shorn of the complexities with which it is usually presented in English bacteriological literature. A list of references giving in full the titles of papers is supplied at the end of each chapter and adds to the usefulness of an excellent little monograph.

An Index of Treatment

Eleventh edition. By Various Authors. Edited by ROBERT HUTCHISON, M.D., LL.D., F.R.C.P., Consulting Physician, London Hospital. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 1020. 42*s.*

THE eleventh edition of this classic work, which begins with the editor's admirably succinct remarks on the principles of therapeutics, includes many subjects not dealt with in previous editions. For example, articles are supplied by the editor on agranulocytosis and its treatment by pentnucleotide, by Prof. A. W. M. Ellis on alkalosis, and by Dr. G. W. Bray on the complex problem of allergic disease. Dr. Donald Hunter writes on idiopathic steatorrhœa and tetany in the adult and the various techniques of cisternal puncture and its therapeutic possibilities are described by Dr. W. M. Feldman. Two other important new articles are by Dr. C. Newman on the functional disorders of the gall-bladder and by Dr. R. Lightwood on the anæmias of childhood. Many other sections have been revised or rewritten in the light of recent knowledge, but it is gratifying to see that those of Mr. James Sherren, a former editor, have been substantially retained. The surgical, X ray, and glandular therapy of acromegaly are discussed by Dr. H. Gardiner-Hill. Prof. L. J. Witts deals with the treatment of the anæmias and Dr. S. Levy Simpson with that of Addison's disease by cortin injections. The section on the ear has been rewritten by Mr. L. Graham Brown, and Mr. Eardley Holland writes on calcium gluconate in the modern treatment of eclampsia. The treatment of acute nephritis by orange juice, of hypertensive encephalopathy by venesection and lumbar puncture, and of the various types of renal œdema are clearly expounded in Prof. Ellis's contribution on nephritis. There are nine articles by Mr. Victor Dix on various genito-urinary conditions and Dr. Levy Simpson describes the treatment of Raynaud's disease by calcium, parathyroid, thyroid, œstrin, and, if necessary, ganglionectomy. The potentialities of superficial and deep X ray therapy are summarised by Dr. J. F. Carter-Braine and the indications for treatment by Sanocrysin, artificial pneumothorax, phrenic paralysis, and thoracoplasty are described in Dr. L. S. T. Burrell's masterly article on pulmonary tuberculosis.

It is no exaggeration to say that this book is a necessity to all who are seriously concerned with therapeutics, and the practitioner, temporarily depressed by lack of therapeutic success, will find herein much to cheer and inspire him to further effort.

Thorpe's Dictionary of Applied Chemistry

Supplement to Vol. III. By JOCELYN FIELD THORPE, C.B.E., D.Sc., F.R.S., F.I.C., Professor of Organic Chemistry and Director of Organic Laboratories, Imperial College of Science and Technology; and M. A. WHITELEY, O.B.E., D.Sc., F.I.C., formerly Assistant Professor of Organic Chemistry at the College. London: Longmans Green and Co., Ltd. 1936. Pp. 166. 21*s.*

IN the course of their preparation of the first two volumes of the supplement to Sir Edward Thorpe's classic work, the editors realised that within the past decade so many new technical terms have been coined that even the expert may find it difficult to understand expressions used outside his own branch of chemistry. To meet this difficulty they have now issued, together with the index to the supplement, a glossary of the terms used in it and of some other words and phrases which are in vogue in laboratory and factory. In completing the supplement they have thus provided us also with a compact independent work of reference whose value is enhanced by its pleasing and legible type.

Chronic Streptococcal Toxæmia and Rheumatism

By J. D. HINDLEY-SMITH, M.A. Camb., M.R.C.S., L.R.C.P. London: H. K. Lewis and Co., Ltd. 1935. Pp. 275. 7*s.* 6*d.*

THE streptococcus is cast for the part of villain in this book and is held responsible by the author for an unpleasant condition which is called chronic streptococcal toxæmia. This condition which, he believes, may begin in childhood, is gradual in its progress and in its method of establishing itself, but may ultimately condemn those who suffer from it to a life of semi-invalidism. Chapter I. opens well. Most readers will be in sympathy with the author's claim that the clearly defined and labelled diseases which progress according to a definite programme, and are described in text-books, account for a minority of

the ills of mankind; whereas most of the diseases met with in general practice are neither well defined nor really understood, and much good could be done by collecting and sorting out clinical observations, particularly those made by experienced practitioners. When, however, Dr. Hindley-Smith proceeds to such statements as "the vast majority of cases suffering from chronic toxæmia are suffering from acid toxæmia, and the causes giving rise to acid toxæmia are legion," most of us will part company with him. This conception of acidity and acid toxæmia in relation to the rheumatic diseases has surely been discarded. In their book on chronic arthritis reviewed in THE LANCET (1935, i., 618) Pemberton and Osgood say wisely: "One frequently hears from patients the statement that his doctor has told him he was 'too acid,' to counteract which condition he was given alkali in some form. The time is past when medical men can afford to tolerate such vagaries which have neither clinical nor scientific justification." Dr. Hindley-Smith's suggestion that the victim of prolonged anæsthesia will experience the feeling of general poisoning throughout the system long after consciousness has returned is also misleading. The alarming picture drawn of the sufferer from chronic streptococcal toxæmia is surely exaggerated. So the book goes on, a mixture of shrewd observation and comment interlarded with loose statements for which there is no scientific support. All we can say of it in praise is that the section on treatment should help the doctor whose patients are clamouring for "something to be done."

The Anti-Drug Campaign

An Experiment in International Control. By S. H. BAILEY, Senior Lecturer in International Relations, London School of Economics and Political Science. London: P. S. King and Son, Ltd. 1936. Pp. 264. 12*s*.

Mr. Bailey has put together a useful and timely account of the tangled story of the efforts to secure international control of the traffic in dangerous drugs, from the Shanghai Commission of 1909 to the Convention on Limitation of Manufacture of 1931. In an appendix extending over a hundred pages there are set out the provisions of the Hague Convention of 1912, the Geneva Agreement and Convention of 1925, the Bangkok Agreement and the Limitation Convention of 1931. The evolution of international control of the traffic in opium, morphine, heroin, and cocaine is described, but it is recognised that side by side with the licit demand, clandestine opium smokers and drug addicts create an illicit demand of unknown volume. There is thus encouraged the harvesting of quantities of the raw materials which bear no relation even to the most liberal estimates of legitimate requirements. The author regards the Hague Opium Convention of 1912 as an event of the highest significance, being the initiation of a multilateral international instrument for combating a world-wide evil. In view of the persistence of legalised opium-smoking in the Far East, he naively remarks that it is difficult to resist the conclusion that European Powers have taken a lighter view of their responsibilities to the peoples subject to their administration in Eastern Asia than to their nationals in their home countries. The improvements effected under the Geneva Convention of 1925 in the control of international traffic in drugs and the creation of the Permanent Central Opium Board are set off against the failure to limit the production of raw opium and coca leaves to legitimate requirements, a step contemplated by the League of Nations and demanded by the United States delegation. That more remained to be done was shown by the Secretariat of the League when it reported that between 1925–29 more than 100 tons of habit-forming drugs derived from morphine passed into illicit traffic. The disclosures in the "Naarden case," where a licensed Dutch factory was found to have exported over 2000 kg. of heroin and 860 kg. of morphine to the Far East in a little more than one year shocked a good many complacent people, as did also the revelation by Russell Pasha of the havoc wrought in Egypt by uncontrolled drug factories in Istambul. There followed in 1931 the conference and convention on the limitation of manufacture and distribution of narcotic drugs which did not, however, extend to the production of raw opium, coca leaves, prepared opium, or Indian hemp. The attempt to establish a quota system for allocating to each nation a proportion of the world requirements of the drugs in question having been abandoned, the supervisory body, set up by the 1931 Convention, has achieved considerable success in securing both national and international control of the traffic in narcotic drugs. Much remains to be done, notably in the restriction of production of raw opium and coca leaves, but the author is justified in ending his lucid account of the anti-drug campaign with the conclusion that from the tangle of mixed motives which divide the erratic course of governmental policy a constructive purpose has emerged and seems destined to prevail.

A Short Ante- and Post-Natal Handbook

By R. KELSON FORD, M.D., M.M.S.A., St. Olave's Hospital, Rotherhithe. London: Humphrey Milford, Oxford University Press. 1935. Pp. 141. 6*s*.

OUR medical schools and hospitals have something to learn, especially on antenatal supervision, from the clinics and hospitals under local health authorities. The public antenatal clinics are primarily a system of constructive hygiene, whereas those of the teaching and voluntary hospitals or departments remain too exclusively a means of picking out doubtful or abnormal cases for special observation and management. Hence we look for greater prominence of the hygienic, social, and educational aspects in a manual by one in the service of a local authority than in similar books from the teaching schools. Dr. Kelson Ford's introductory chapter is excellent in that these aspects are placed in the foreground of the picture. The reason for antenatal supervision is much more than the detection of pelvic deformity and albuminuria. Stress is laid on the necessity for the careful study of the individual patient, her instruction in hygiene for herself and the infant after birth; the advice to the doctor to make an effort to assess the attitude of mind in which pregnancy is regarded is much needed. Although Dr. Ford has laid down the principles clearly and concisely, he has not been successful in weaving them into the texture of practice with the same clarity and emphasis. The "Author's Note," which occupies the place and office of a preface, does not say more of the object he had in mind than that "no attempt has been made at being exhaustive, a helpful suggestiveness being the aim." This aim has undoubtedly been fulfilled, for he has produced a useful and stimulating

guide to ante- and post-natal care that will appeal to a large class of family practitioners, from whom much is now expected in the way of such service.

Our chief regret is that Dr. Ford has thought fit "to collect information not always readily accessible" into a small handbook, which is not the place for out of the way information. The outstanding instance is an encyclopædic classification of monstrosities and malformations, happily relegated to the appendix, where it takes up more space than any of the other and more suitable matters considered therein. Although he apologises for including much that is elementary, these portions modified in the light of personal experience form the most valuable characteristic of his book, and would best bear expansion. Further detail in such matters as physical exercises for pregnant and lying-in women or in the technique of assessing the patient's mental reaction to pregnancy would have been a welcome addition and most helpful. We trust, also, that other authors in the service of public authorities will not feel constrained to include such a disclaimer as "the London County Council is in no way responsible for any opinion or matter presented." It is a terrifying suggestion that city fathers and county councillors might assume some form of censorship over medical thought and practice, even if only among those in their own service.

Urology in Women

Second edition. By E. CATHERINE LEWIS, M.S. Lond., F.R.C.S. Eng., Surgeon to the Royal Free Hospital; Surgeon and Urologist to the South London Hospital for Women. London: Baillière, Tindall and Cox. 1936. Pp. 100. 6s.

MINOR urinary troubles in women are particularly liable to be missed or to receive inadequate treatment. This is specially true of lesions of the urethra and bladder, organs that lie on the boundary of gynæcological practice and in which the gynæcologist as a rule is not keenly interested. Minor lesions of the urethra are often missed, and the examination of this structure even by the urologist himself is often perfunctory. It was therefore the sections in the previous edition of this book which dealt with such conditions as urethral prolapse, urethritis, stricture, displacements of the bladder, and vesical neck obstruction that proved especially valuable. In this edition sections on nephroptosis and on changes in the ureters during menstruation and pregnancy have been added.

The book should be studied not only by practitioners, but also by gynæcologists and urologists.

Glandular Physiology and Therapy

A Symposium prepared under the auspices of the Council on Pharmacy and Chemistry of the American Medical Association. Chicago: American Medical Association. 1935. Pp. 528. $2.50.

DURING 1935 a series of excellent articles on glandular physiology and therapy appeared in the *Journal of the American Medical Association*, prepared under the auspices of the council on pharmacy and chemistry of that Association. These articles have now been collected together to form a symposium of a comprehensive nature. The last publication of the kind appeared originally in 1925 and in revised form appeared two years later. Since then, however, remarkable advances have taken place in endocrinology. Each chapter is an authoritative discussion by a well-recognised worker. Thus, Evans writes upon the clinical manifestations of dysfunctions of the anterior pituitary and the growth hormone; Collip deals with the inter-relationship among urinary, pituitary, and placental gonadotropic factors; Allen discusses menstruation and the physiology of œstrogenic principles; and Marine writes on goitre; other chapters are supplied by Best, Joslin, Aub, Aschheim, Fishbein, Novak, and Zondek.

Clinicians and physiologists alike will appreciate this symposium.

THE RED CROSS AS SANCTUARY

A MEMORANDUM on observance of the Red Cross in warfare has been prepared for presentation to the Italian Ambassador by members of the medical profession. Its terms are as follows:—

We, who sign this memorandum as members of the medical profession, wish in this way to express our profound uneasiness at the news of certain incidents that have occurred in the course of the present war between Italy and Abyssinia. It is reported that on six occasions units clearly displaying the Red Cross have been bombed from the air by the Italian forces; and it seems to be established that on some of these occasions, at least, the action was premeditated.

The members of our profession have never assumed or claimed that they, any more than other citizens, should be held immune from the risks of war. The character of their work calls for men and women of normal courage; and the casualties among doctors attached to fighting units during the European War are themselves proof that this protest is no mere personal one. Our sense of indignation lies far deeper. In wartime, the wounded and those who attend them have for long past been considered as in a sanctuary when beneath the Red Cross. Amongst civilised peoples the Red Cross has been looked upon as an assurance that, above the shifting tides of national strife, commercial rivalry and war, there still lives the true bond of common humanity. If this permanent bond, symbolised by the respect customarily paid to the Red Cross, is also to be destroyed, then mankind takes a further step backwards towards the chaos of barbarism.

The fact that our profession usually does its work unostentatiously makes it all the more becoming that we should from time to time express ourselves most emphatically on a matter that so gravely touches our professional conscience. It is necessary that all who follow the vocation of medicine should insist that the symbol of the Red Cross in war be held absolutely sacrosanct.

In order that the protest may be as effective as possible, all those who wish to associate themselves with it are requested to communicate as soon as possible with Dr. T. O. Gariand, 23, South Hill Park-gardens, London, N.W.3, so that their names may be added to the list of supporters.

The preliminary list of supporters, we are informed, includes:—

Rt. Hon. Christopher Addison, P.C.
Dr. G. F. Barham.
Dr. F. G. Bushnell.
Dr. D. Elizabeth Bunbury.
Dr. William Parr.
Dr. E. Vipont Brown.
Dr. H. Crichton Miller.
Prof. Millais Culpin.
Dr. W. R. Dunstan.
Mr. P. G. Doyne.
Prof. W. M. Frazer.
Dr. David Forsyth.
Prof. Major Greenwood.
Dr. Helen Gillespie.
Mr. Somerville Hastings.
Dr. P. D'Arcy Hart.
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Dr. Peter Kerley.
Dr. John D. Kershaw.
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Dr. M. W. Walmsley.
Prof. E. J. Wayne.
Dr. Robert F. Collis.
Dr. Stella Churchill.
Dr. Doris Odlum.

THE LANCET

LONDON: SATURDAY, MARCH 7, 1936

MESCALINE IN PSYCHIATRIC RESEARCH

THE field for controlled experimental research in psychiatry is still so small that it demands intensive cultivation. One of the few methods available is a pharmacological one—i.e., the use of intoxicating drugs. The psychosis thus produced can be studied with a much closer regard to experimental requirements than is possible with the mental disorders in general, dependent as they are on a variety of causes which the investigator can seldom influence in any predictable direction. Foremost, though not unique, among the intoxicants that may be used for research along such lines is mescaline. Now available as a synthetic drug, its ritual use on the American continent stretches back to the time before the Spanish Conquest. Fascinating as are the ethnological associations of the mescal plant, it is as a source of beatific visions that it has become generally and somewhat romantically known in Western Europe. The visions consist of fantastic forms and colours constantly changing but always bright. Dr. MACDONALD CRITCHLEY, who made some subjective experiments in 1930, described [1]—

"a meadow with buttercups and daisies; now it is changing into a stereotyped park, with a bandstand and with chairs, each one of which is whizzing rapidly round on its own axis. Butterflies are coming in from all sides; the bandstand has disappeared. The butterflies all collect into the centre and arrange themselves into a circular, brightly coloured flowerbed, rotating rapidly in a clockwise direction, in a most wonderful manner . . . now a huge field of primroses . . . a complicated pattern like Hampton Court maze, brightly coloured with objects moving quickly in a snake-like, sinuous fashion along the apparently endless pathways of the maze."

All who have enjoyed the contemplation of just such sights and sequences in a Silly Symphony will appreciate what a state of rapture they may induce. The range of the abnormal phenomena to which mescaline gives rise is, however, wider and more important from the investigator's point of view than the visual disturbances alone. The independent phenomena in other sensory territories, the synæsthesiæ, the alteration in bodily feeling, the disorder experienced in space and time-judgments, the effects on mood and thought, the depersonalisation and the power of detached observation of oneself are among varied manifestations which have been closely studied by psychiatrists. WEIR MITCHELL and HAVELOCK ELLIS drew attention to them in the last century; since the war some workers at Heidelberg, ROUHIER in France and others have examined the matter thoroughly.

[1] See THE LANCET, 1930, ii., 865.

At the meeting of the Royal Medico-Psychological Association on Feb. 26th Dr. ERICH GUTTMANN described investigations to which he had contributed before he came to England, and gave an account of the further mescaline research which he and others are carrying out at the Maudsley Hospital. By means of the Rohrschach test, administered to the same persons before and after intoxication, he had observed the changes in those responses which are regarded as indicative of the psychological type and personality of the subject. By this means the contribution of the individual to the psychosis—a question of the first importance for psychopathology—can be studied, as well as the effect of specific noxael on psychic structure; the rôle of perception in the total personality also enters into the field of experiment. On the same subjects (normal volunteers) Dr. W. H. HUBERT and Dr. AUBREY LEWIS studied by a special optical technique the changes in Gestalt-formation produced by the drug; striking variations were found, again bearing on the importance of the perceptual side of personality. Comparative investigations, using the same technique, but without mescaline, on schizophrenic patients and others with depersonalisation were made, and provide an instance of the valuable approach which mescaline affords to the study of mental illness, especially where, as in schizophrenia, the investigator cannot otherwise than by mescaline himself gain any subjective experience of the incommunicable phenomena. Dr. GUTTMANN has, moreover, in conjunction with Dr. W. S. MACLAY, attempted to make therapeutic use of the drug. The known effects on sensory function led them to expect that the symptom of depersonalisation with feeling of unreality might be so modified or abolished temporarily by small doses of mescaline that the patient would be more accessible, after this relief, to psychotherapy. The results, so far as feelings of external reality were concerned, conformed to expectation (though not in all cases) and the change extended beyond the period of intoxication. Incidentally Dr. GUTTMANN and Dr. MACLAY hold that to give mescaline continuously to any patient would not be justifiable while we know so little about the dangers of chronic mescaline intoxication.

The information available about the oxidative and enzymic activities of the brain during mescaline intoxication has so far indicated only a common mode of action of narcotics and throws no light on the specific effects of the drug. Dr. P. K. MCCOWAN stressed the importance of further research into these activities. Dr. GUTTMANN referred to the physical changes which appear during intoxication and to their metabolic significance. It is noteworthy that in 1932 an observer reported that in hashish intoxication the output of salt and water is increased, without any concomitant hydræmia; it is not known whether any corresponding change is associated with mescaline. It is an attractive speculation that there may be links between mescaline and some of the end-products of protein metabolism—e.g., tyrosine—

to which it is chemically allied; an attempt to discover whether some perversions of normal metabolism result in the production of a toxic substance closely akin to mescaline pharmacologically as well as chemically might be fruitful. Admittedly no substance closely related chemically to mescaline has as yet been found capable of giving rise to its remarkable effects; whether further research be metabolic or psychological, the value of a pharmacological approach to the problems of psychiatry can hardly be doubted.

HEAT REGULATION AND FEVER

IN his Arris and Gale lectures just delivered before the Royal College of Surgeons of England Dr. JOHN BEATTIE reviewed various aspects of the heat-regulating mechanism of the body, and expressed his belief that this mechanism is much more complicated than has hitherto been realised. The notion that heat regulation is dominated completely by a single centre is in his opinion misleading, and he was able to show that sections at different levels of the central nervous system produce widely different effects. The argument in favour of a single centre has been founded largely on experimental demonstration that section of the cervical cord completely abolishes the heat-regulating mechanism so that the animals become poikilothermic. To support this conception there is also the older evidence from heat piqûre, and the more recent observations that local heating of the hypothalamus is followed by lowering of the body temperature, and local cooling by a rise in the body temperature. To the contrary, however, we have abundant clinical evidence, beginning with a case recorded by BRODIE in 1837, that in man complete destruction of the cervical cord is not always followed by a loss of heat regulation and that even fever has been observed in such patients. A few isolated observations on animals are also on record such as those of GOLTZ and EWALD in 1896, and the more recent ones of POPOFF,[1] where heat regulation was maintained after removal of the spinal cord from the cervical region downward with subsequent cutting of the vagus and sympathetic in the neck. In order to determine the reason for this contradiction, THAUER,[2] working in BETHE'S laboratory, has lately carried out an extensive experimental reinvestigation of the effects of section of the cervical cord on a large number of rabbits, guinea-pigs, and rats. Suspecting that the discrepancies might be due to immediate shock effects masking the true results of the operation, he endeavoured to improve the operative technique and post-operative treatment. By keeping the animals immediately after the operation in a thermostat at 28°–30° C. and by careful attention to their feeding, he succeeded in keeping a number of animals alive for several weeks, and three rabbits for two months after the operation. In all these animals the heat-regulating mechanism was almost completely restored, although during the first few days after the operation it was severely impaired. When once the heat regulation had been restored subsequent cutting of the cervical sympathetic and of the vagi, and even subsequent partial removal of the thoracic spinal cord, failed to impair it. THAUER'S results agree, therefore, with those of POPOFF in showing that in warm-blooded animals after complete exclusion of the central nervous system the heat regulation of the body can be efficiently maintained by a peripheral mechanism. The nature of this peripheral mechanism has been indicated by the work of CRAMER, who showed in his well-known monograph[3] that in addition to the nervous mechanism for heat regulation there is a humoral mechanism with which the thyroid and adrenal glands are particularly concerned. Since most of the factors concerned in heat regulation are controlled by the sympathetic nervous system, they can be brought into play either by nervous or by humoral stimulation. Thus fever can be produced experimentally by functional hyperactivity of the thyroid or adrenal glands, and THAUER has shown that his animals deprived of their central nervous control still respond to infections or to the injection of pyrogenic substances by fever.

The experiments of POPOFF and of THAUER must, of course, not be interpreted as denying the existence of a nervous mechanism for heat regulation or of a central coördination of such a mechanism. Such a conclusion would be as crude and as misleading as the reverse one that the thyroid or adrenal glands have no part in the processes of heat regulation because these processes can still be efficiently maintained after removal of one or other of these organs. We are being led to a belief that there are two mechanisms for heat regulation, one central and the other peripheral, a conception in keeping with modern physiological trends in other bodily functions. In the control of water metabolism, the control of equilibrium, and in sensory discrimination there are parallels for the overlaying of a crude peripheral type of regulation by a more delicate centralised one. On our present knowledge of heat regulation it must be supposed that the intracranial apparatus is not essential to an adequate working, but rather by allowing an interplay between the different peripheral factors serves to increase their efficiency, especially under pathological conditions.

The conception of a single centre dominating heat regulation has tended to sterilise progress, and a study of LAKIN'S Lettsomian lectures[4] reveals how scarce investigations on the phenomenon of fever —one of the most frequent and important clinical symptoms—are in the recent physiological, pathological, and clinical literature. It is easy to understand why this should be so. On the unitary conception fever is explained as being due to some action on the heat-regulating centre in the brain which is likened to a thermostat, and in fever is

[1] Popoff, N. F.: Arch. f. d. ges. Physiol., 1934, ccxxxiv., 137.
[2] Thauer, R.: Ibid., 1935, ccxxxvi., 102.
[3] Cramer, W.: Fever, Heat Regulation, Climate, and the Thyroid-Adrenal Apparatus, London, 1928.
[4] Lakin, C. E.: Disturbances of the Body Temperature, THE LANCET, 1934, ii., 467.

supposed to be "set" at a higher temperature. But from what has been said above, and from what Dr. BEATTIE said in his lectures, it is clear that if there is a heat-sensitive zone in the brain there must also be other thermo-regulators outside it—represented perhaps by the sympathetic ganglia. Formerly it was assumed that the fever of infectious diseases is due to the action of bacterial toxins on cerebral centres; but it has now been shown that many bacterial toxins circulating in the blood cannot pass the blood-brain barrier,[5] which is additional evidence that their effects must be on the periphery. Moreover, it is now known that some pathological conditions of the thyroid or adrenal glands are associated with a pyrexia indistinguishable from that of an acute infection, for which in the past they have been frequently mistaken. This recent work on the decentralisation of sympathetic functions may well open up new fields for clinical applications in the pathogenesis and treatment of infectious diseases and of other pyrexial conditions whose origin is at present only surmised.

ACUTE NICOTINE POISONING

LAST week Dr. L. P. LOCKHART drew attention in our columns to a case in which a father, in order to make his 14-year-old boy give up smoking, adopted the heroic measure of forcing him to eat a cigarette. Curiously enough, "the father's action appears to have received the approval of the court," and Dr. LOCKHART rightly raised a protest. It is salutary to remember that poisoning by small doses of concentrated nicotine is usually rapidly fatal, and that present-day remedies are often of no avail. Admittedly recorded fatal cases are few, but as ESSER and KÜHN [6] point out their incidence has increased recently. In many of them nicotine is taken with suicidal intent, but poisoning has also occurred in factories where concentrated nicotine is handled and in tobacco factories. Non-fatal poisoning is seen among cigar and cigarette makers who inhale tobacco dust and among workers who handle concentrated nicotine and may have their skin splashed with it. The main symptoms are ocular troubles, such as partial blindness with limitation of the fields of colour vision, functional heart disease, and nervous disorders. ALICE HAMILTON [7] says that new workers in factories often suffer from the same disorders as the inexperienced smoker—headache, palpitation of the heart, rapid irregular pulse, nausea, and vomiting. She regards the evidence for the existence of chronic nicotine poisoning as scanty because sooner or later an immunity to the drug is established. However this may be, it is certain that more cases of acute nicotine poisoning are occurring at the present time, and it is therefore important that an adequate method of treating it should be found.

FRANKE and THOMAS,[8] who have just reviewed the subject, say that apart from the usual procedures for removing any unabsorbed poison and the administration of stimulants, they have been unable to find any description of a rational treatment for nicotine poisoning. The condition is usually considered to be hopeless: "this pessimistic attitude is apparently due to the belief that the drug causes generalized paralysis of the central nervous system, based on the fact that complete muscular paralysis, loss of reflexes and paralysis of respiration (and finally of circulation) follow its absorption in sufficiently large doses." Their own experiments on dogs, however, lead them to think that death from nicotine poisoning is caused by peripheral, rather than central, paralysis of the respiratory muscles. Further, they show that nicotine does no evident irreparable damage to any of the structures on which it acts, and that the administration of very large doses is not incompatible with reasonably prompt and apparently complete recovery when appropriate treatment is started in time. FRANKE and THOMAS come to the important conclusion that nicotine poisoning should be regarded as a temporary respiratory emergency comparable with drowning or electric shock, and should be treated in the same way as these two conditions, especially by artificial respiration. They tried various means of treatment and resuscitation on 52 dogs poisoned with nicotine and found that if artificial respiration was applied before the circulation had failed, and maintained until the muscular paralysis had disappeared, each animal made a complete recovery. When treatment was started after failure of the circulation, artificial respiration by itself was usually not sufficient; but that if the animals were given in addition intracardiac injections of epinephrine (adrenaline) and indirect cardiac massage about half of them recovered. The important thing about these experiments is that they demonstrate that the circulatory failure which follows fatal doses of nicotine in dogs is not necessarily permanent, but that if the heart can be restarted and artificial respiration maintained prompt recovery is usual.

If FRANKE and THOMAS's conclusions are valid and can be applied to man they should lead to an increase in the proportion of recoveries from acute nicotine poisoning; for these authors have been able to find only 3 recorded in which artificial respiration has been used in its treatment. MOORE and ROWE [9] in 1897 pointed out that the observed effects of nicotine could all be as readily ascribed to a curare-like action of the drug as to a central paralysis; and GOLD and BROWN [10] have recently presented strong evidence that in animals it causes a peripheral rather than a central paralysis of respiration. It appears therefore that artificial respiration is the basis of a rational treatment for acute nicotine poisoning.

[5] Friedemann, V., and Elkeles, A.: THE LANCET, 1934, i., 719.
[6] Esser, A., and Kühn, A.: Deut. Zeits. f. d. ges. gerichtl. Med., 1933, xxi., 305.
[7] Hamilton, Alice: Industrial Toxicology, New York, 1934, p. 246.
[8] Franke, F. E., and Thomas, J. E.: Jour. Amer. Med. Assoc., Feb 15th, 1936, p. 507.
[9] Moore and Rowe: Jour. of Physiol., 1897, xxii., 273.
[10] Gold, H., and Brown, F.: Jour. Pharmacol. and Exper. Therap., 1935, liv., 143.

PENAL CASES IN CAMERA BEFORE THE G.M.C.

THE prolonged hearings in camera recently of penal cases coming under the consideration of the General Medical Council may have been taken as evidence of a tendency on the part of the Council to conduct more of such proceedings without a public audience. But as a matter of fact the situation is not so, and the circumstances at the last session of the Council were quite fortuitous. It is inadvisable, however, that an impression should remain that the G.M.C. is embarking upon a new policy of secrecy.

The penal jurisdiction of the Council rests substantially on these three words in the Medical Acts—"after due inquiry." The Acts provide that, in cases other than those based on convictions of felony or misdemeanour, the Council, if it finds "after due inquiry" that the practitioner has been guilty of infamous conduct in a professional respect, may direct the Registrar to erase the practitioner's name from the Register. We need not now refer to the unfortunate phraseology which has led to frequent protest. The word infamous has a technical legal meaning explained by the judges as disgraceful or dishonourable in a qualified professional man acting as such; but the scope of the words "after due inquiry" has never been exactly defined. When an action of the Council has been the subject of legal inquiry the Law Courts have taken the view that the Council can be trusted to manage its own business properly and competently, and they will not interfere unless the complainant can show a substantial impropriety of procedure. The Council's procedure is governed by its standing orders, which probably lack the statutory force comparable with the by-laws of some other semi-public bodies. But the orders give the Council wide powers of discretion in deciding which, if any, parts of the case shall be heard in camera. The Council is obliged only to open the case, that is to have the charge read, and to give the judgment in public, and variation from procedure in courts of law is conspicuous. All courts are open to the public unless in the opinion of the judge it would be clearly impossible to do justice at a public hearing, and the judge's discretion here is limited. The class of cases in which courts have restricted publicity are those in which the subject matter of the action has been some secret process; those where a witness must give evidence of such a distressing kind that he would not bring his complaint at all if he knew that the hearing would be public; and thirdly, where disorder is held reasonably certain to break out in court during the hearing. The General Medical Council is only concerned with cases of the second class, and has interpreted its discretion widely. The criterion applied by the Council it would seem is not whether justice can be done at all in public but whether it can be better done in private, while taking note of the fact that in the interests of decency some cases had better be heard in camera. Anyone who has followed the penal procedure of the Council at all closely will know how few are the cases that fall under the latter heading; and it must be remembered that medical men summoned to appear before the Council may be willing, and naturally would be when innocent, to have the procedure a perfectly public one, the decision to hold the inquiry in camera being that of the Council.

When public attention is arrested by penal cases before the G.M.C., there is a natural surprise that the verdict of the Council, though it may deprive a professional man of his livelihood, is subject to no appeal. The victim's friends, thinking him innocent, attack the doctor's profession for an act of injustice which is final. This absence of appeal is due not to the caprice of the profession but to the will of Parliament as declared in the Medical Acts. From disciplinary decisions in other professions—dentists and solicitors, veterinary surgeons and architects—there is in each case an appeal to the High Court under the corresponding statute. The Medical Acts alone make no such provision. Consequently, as Lord Justice BOWEN observed, when "due inquiry" has been made by the G.M.C., "the jurisdiction of the domestic tribunal, which has been clothed by the Legislature with the duty of discipline in respect of a great profession, must be left untouched by courts of law." But the courts of law will intervene fast enough if the tribunal displays bias or transgresses the rules of what is rather vaguely called "natural justice" in its inquiry. In that event, it is safe to predict, amendment of the Medical Acts will follow.

ON Tuesday, March 24th, at 5 P.M., Sir Thomas Barlow will take the chair at the hundredth annual general meeting of the Royal Medical Benevolent Fund, which is being held at 11, Chandos-street, London, W.1.

THE appointment of Mr. Wilfred Trotter, F.R.S., to a chair of surgery in the University of London, tenable at University College Hospital medical school, is recorded in another page. No academic honour could enhance the reputation of one who has long been recognised not only as a master of his craft but as a scholar whose ripe philosophy pervades all his activities. But by consenting to sacrifice the leisure gained through retirement from private practice he confers additional distinction on the institution which he has already served for many years.

Mr. GEORGE VERITY, who died at his home at Chesham Bois on Feb. 28th, was a truly practical friend to the cause of medicine. He was for close upon thirty years chairman of the governors of Charing Cross Hospital, and everyone concerned with the welfare and organisation of the great London hospitals knew of the work which he did at Charing Cross and admired the foresight and energy displayed. He accepted the responsibilities of chairmanship at a critical period in the history of the hospital which was suffering perhaps more acutely than any other of the metropolitan institutions from financial depression. The fine position in public and scientific esteem in which the hospital is now held was greatly due to Verity, for whom, in his labours, no ideal was too large to aim at and no detail was too small for attention. He has left a great name in the hospital world.

ANNOTATIONS

WEIGHT-LOSS AND POST-OPERATIVE MORTALITY IN GASTRIC SURGERY

POST-OPERATIVE pulmonary complications are notoriously more common after upper abdominal operations than after most other major surgical procedures, and the factors that determine them are still imperfectly understood. Among those factors is undoubtedly the patient's "resistance," both to infection in general and to operative shock—an imponderable factor, one would have said, a measure of which would be of great value were it feasible. H. O. Studley,[1] of Cleveland, has just suggested that it may be in some degree ponderable after all, and that literally. He took a series of 46 consecutive patients operated on for gastric and duodenal ulcer, excluding urgent laparotomies for perforation and acute hæmorrhage. There were 7 post-operative deaths (15 per cent.). These seemed to bear no relation to age, pre-existing cardiac or pulmonary disease, the position of the ulcer, the presence of pyloric stenosis, or the nature and technique of the operation. When he calculated, however, the amount of weight that the patients had lost before they came to operation, he found that 6 of the 7 deaths occurred among those who were 20 per cent. or more below their normal or highest known weight. This group contained 18 patients, with weight-losses ranging from 21 per cent. to 43 per cent. Five out of the 6 who died developed pulmonary infections, which may be supposed to have been the chief cause of death, although in 2 of them the wound ruptured as well. The sixth apparently died from wound rupture alone. In the other group of patients, numbering 28, who had lost only 3–19 per cent. of their maximal weight, 5 examples of pulmonary infection occurred but were not fatal, while the only death that did occur was due to ileus of mechanical origin.

On such scanty evidence the author's thesis cannot be accepted as a sound conclusion, but as a tentative suggestion it is worth considering. Thyroid surgeons have come to think that a rising weight in a patient with thyrotoxicosis augurs well for a smooth passage in thyroidectomy, and it may well be that slow changes in body-weight, not produced by disturbances in water balance, are a useful indication of the body's general metabolic well-being and of its "resistance." More observations are easily made, and are worth making. But if the thesis should come to be sustained, it is not necessarily to be used as an argument against what Studley calls "the policy of delay in advising surgical treatment of chronic peptic ulcer, . . . now generally followed." It rather points to the need for such pre-operative preparation of the patient as will restore some of his lost weight and strengthen his resistance; except in cases of obstruction, rest in bed and suitable feeding—in some cases perhaps duodenal or jejunal tube-feeding—will often achieve this end, and in the obstructed cases the same thing can be done by means of a preliminary jejunostomy made under local anæsthesia.

MEDICAL OPUSCULES

THE reading supplied in this interesting volume of "Opuscula Selecta" (issued by the *Nederlandsch Tijdschrift voor Geneeskunde*, Amsterdam) is of a varied sort. It is made up of letters interchanged between distinguished doctors of different nationalities and sometimes between them and their patients, dealing with surgical and medical incidents that may be considered to have formed sign-posts in science. The dates range over the sixteenth, seventeenth, and eighteenth centuries. Dr. M. A. Van Andel points out in an interesting editorial preface that only by such letters could diffusion of medical information take place at a time when very few scientific books were printed and those only at great expense, while during the infancy of printing the suggestion of journalistic production could not have occurred to any mind. Undoubtedly the savants of this grand period in scientific activity exchanged many valuable contributions to knowledge in this manner, and the doctors as well as other leaders of thought were great letter-writers, their patients often being described in the most particular terms. It may be noted, here, that Guido Patin avers that there is as much difference between a doctor's dependence upon information from a distance about the condition of a patient as between Alexander the Great conducting a campaign personally and a king making war through his generals—the difference between conjecture and discovery. The letters throughout abound in theoretic commentaries which to some extent take the place of the clinical conferences of to-day. The authors include, among others, Vesalius, Van Beverwijck, Descartes, Boerhaave, Petrus Camper, and three communications from certain later surgeons are added, among them notes from Diderik Ort and Johan Ramaer to Prof. Tilanus describing cases of gastrotomy. The book is illustrated with pictures of many of these old masters, which are accompanied by biographical notes carefully dated. There is, alas, no index, thus adding to the difficulty of the reader, who will find the languages employed by the writers not necessarily familiar though the letters are furnished sometimes with Latin translations.

NARCOSIS IN ANIMALS AND MAN

THE danger of applying to human beings conclusions drawn solely from experiences with animals was one of the morals drawn by Prof. J. G. Wright when he spoke on the use of non-volatile narcotics at the Royal Society of Medicine last week. His paper, read before the section of comparative medicine on Feb. 26th, showed what great advances the practice of anæsthetics has made of recent years in veterinary surgery. Even for minor operations anæsthesia is now usual, and is generally obtained by the combination of narcosis and local anæsthetics. Slow intravenous injection of Nembutal is a highly satisfactory means of getting narcosis in both dogs and cats. For the horse the enormous amounts required, grs. 200 for example, render this drug impracticable economically. All animals have a natural fear of restraint, which at once puts them into a different category from the average normal human subject. Fear and struggling greatly increase the risks associated with inhalation anæsthesia, and it is in abolishing these that the intravenous use of narcotics has so well proved its value in animal surgery. The excitement sometimes witnessed in narcosis was, Prof. Wright said, hard to explain. It shed some light, another speaker suggested, on the psychological causes attributed to the excitement often witnessed in human patients of certain type after consciousness had been abolished and when it was supposed that the "subconscious" mind had

[1] Jour. Amer. Med. Assoc., Feb. 8th, 1936, p. 458.

assumed uncontrolled sway. Avertin, Prof. Wright believes, is not nearly so satisfactory in veterinary as it is in human surgery. Dr. D. H. Belfrage, who gave a capital summary of the use of the non-volatile narcotics by anæsthetists practising among mankind, expressed a preference, on the whole, for avertin, but approved highly of nembutal for young children. Mr. Basil Hughes thought that by a combination of avertin and local anæsthetics he achieved results in abdominal surgery even better, so far as the post-operative state was concerned, than those claimed by Finsterer for splanchnic analgesia. Mr. Hughes related cases showing the possible danger of Evipan, and claimed good results for the use per rectum of a mixture of magnesium sulphate, paraldehyde, ether, and gum acacia. Sir Frederick Hobday, while admitting the excellent work made possible by newer methods, thought that chloroform properly given still held a big place in veterinary surgery.

FUNCTIONS OF THE PINEAL

A CURIOUSLY indecisive controversy has raged for centuries over the functions of the pineal gland. Indeed, it might well be claimed that there is as much experimental evidence for the view of Descartes, who considered the pineal the seat of the soul, as for that of more modern writers who connect the pineal directly with virility. It has been shown that the organ is not essential to life; the curious syndrome of precocious puberty and somatic overgrowth which has been described in young boys suffering from tumour of the pineal has been variously attributed to hyper- and hypo-function of the gland, while Harvey Cushing has attributed these phenomena to secondary effects upon the pituitary. Experimental extirpation of the pineal gland in animals has led to consistently negative results according to certain workers, and to the appearance of macrogenitosomia and obesity in the experience of others. The results of feeding the organ to young animals have been equally confusing. The evidence is in fact conflicting even as to whether the gland has any endocrine function at all. Rowntree and his collaborators[1] have now recorded the results of injection of a pineal extract prepared after the technique of Hanson, using successive generations of rats. These authors had previously found that continuous administration of thymic extract to successive generations of parent rats had resulted in precocity in the offspring, a method which suggested the present experiment. The pineal extract was injected intraperitoneally, and the offspring of the injected rats were mated in pairs; the offspring of these were also injected. The authors found little effect on the first generation under treatment, but succeeding generations have shown progressively more marked retardation of growth and precocity of development from the third generation onward. The resulting animals were therefore "precocious dwarfs"; in addition to having in early life large genitalia suggestive of those seen in macrogenitosomia præcox, the young animals were of bizarre and characteristic appearance, with "short snout, broad face, round head, heavy jowl, and bulging eye." The authors comment on the high incidence of eye disease in these animals, blindness being common, though usually unilateral. Bilateral cataracts, bilateral anophthalmia, and congenital hypertrophy were also observed. These results, which were obtained on several hundred rats, are of peculiar interest if they can be proved definitely to be due to a substance present in the pineal; they appear paradoxical when compared with the condition associated with tumours of the pineal—the stimulation of bodily growth and of genital development. Some caution must be exercised in accepting the results obtained as due to the action of the pineal itself, however, since the extract used represented an acid aqueous derivative (probably a picrate) and contained 0·21 per cent. free trinitrophenol, whilst it is perhaps significant that more refined extracts were less active.

[1] Rowntree, L. G., Clark, J. H., Steinberg, A., and Hanson, A. M.: Jour. Amer. Med. Assoc., Feb. 1st, 1936, p. 370.

RESEARCH IN TROPICAL MEDICINE

THE work of the Medical Research Council has never been restricted by territorial limitations, but hitherto the Council have not been able to assist investigations in the tropics except on isolated occasions, although they have regularly made grants for work at home in relation to tropical problems. An intention to take a more active part in field work is indicated by the establishment announced this week of a tropical medical research committee. The decision to appoint this new committee has been taken by the Medical Research Council in consultation with the Colonial Office. It will give advice and direction in the prosecution of such investigations as the Council may be able to promote, at home or abroad, into problems of health and disease in tropical climates, and make suggestions for research in this field. It will include representatives of the Colonial Office and of the Liverpool and London schools of tropical medicine, with other members appointed as individual experts in tropical medicine or in different branches of medical science. The original members are: Prof. J. C. G. Ledingham, F.R.S. (chairman), Prof. A. J. Clark, F.R.S., Dr. N. Hamilton Fairley, Prof. W. W. Jameson, Dr. Edward Mellanby, F.R.S., Miss Muriel Robertson, D.Sc., Sir Leonard Rogers, F.R.S., Dr. H. Harold Scott, Sir Thomas Stanton, Dr. C. M. Wenyon, F.R.S., Prof. Warrington Yorke, F.R.S., and Mr. A. Landsborough Thomson, D.Sc. (secretary).

NON-SPECIFIC IMMUNITY OF THE PERITONEUM

MANY substances have been proposed and used for inducing a pre-operative increase of resistance to bacterial infection in the peritoneal cavity. Some years ago H. L. Johnson[1,2] reported that amniotic fluid introduced into the peritoneal cavity reduced the incidence of adhesions after Cæsarean section, and that the fluid increased the resistance of the cavity to infection. The same author and his associates[3] now present an extensive survey of this latter phenomenon in dogs. They have used a chemically prepared fraction of bovine amniotic fluid and compare its action with that of papain, sodium merthiolate, sodium ricinoleate, and *Bact. coli* vaccine. The merthiolate and saline alone produced very little response. Papain, which has been used to prevent adhesions, dissolved fibrin and the mesothelial layer of the peritoneum, but induced no beneficial inflammatory reaction. The ricinoleate was apparently toxic. *Bact. coli* vaccine induced a large leucocyte response in the peritoneal exudate and in the blood which reached a maximum in 24 hours and was maintained up to 72 hours. The exudate was heavily blood-stained, extensive hæmorrhage had occurred in the subserous tissues, and the

[1] Surg., Gyn., and Obst., 1927, xlv., 612.
[2] New Eng. Jour. Med. and Surg., 1928, cxcix., 661.
[3] Surg., Gyn., and Obst., February, 1936, p. 171.

cellular response was mainly histiocytic. The amniotic concentrate induced a pink exudate; the maximum white cell response occurred in 12 hours, followed by a rapid fall, and a considerable subserous œdema in the peritoneal tissues was followed by an exudate rich first in polymorphonuclear leucocytes and later in histiocytes. The authors favour the amniotic fluid as giving the classic sequence of inflammatory events, while, for example, the coli vaccine and the papain give a distorted response. There does not seem to be adequate ground for believing that the "classic" is any more beneficial in immunity than the "distorted." However, if we assume that a quick leucocyte and plasma response without much damage to the tissues is required for an increase in peritoneal immunity, the amniotic concentrate is to be preferred to the coli vaccine. Dogs thus immunised were tested by the intraperitoneal inoculation of heavy doses of living *Bact. coli*. The survival rates in the various groups were as follows: 7 out of 8 with amniotic fluid concentrate; 6 out of 9 with coli vaccine; and 5 out of 8 controls receiving saline as an immunising agent. The samples are so small that the figures do not indicate with certainty that either the vaccine or the amniotic fluid concentrate are superior to normal saline in immunising value. At present the prophylactic value of the concentrate depends on reports of its clinical efficacy. This is very hard to assess and a significant improvement in the production of immunity by the use of the concentrate in controlled laboratory tests is required before it can be accepted as an agent for general use.

A NEW INTERNATIONAL CONFERENCE ON DANGEROUS DRUGS

ATTENTION has been called again and again in our columns to the appalling extent of illicit traffic in narcotic drugs. While the International Opium Conventions of 1912, 1925, and 1931 have controlled and regularised the legitimate trade in drugs of addiction, there is indisputable evidence that little or no improvement has been effected in suppressing clandestine manufacture and contraband commerce. At a recent meeting of the Council of the League of Nations an important decision was taken in the right direction. On the motion of M. de Vasconcellos it was resolved to summon a diplomatic conference to consider a draft convention which has been prepared for the suppression of illicit traffic in dangerous drugs. Invitations to the conference will be addressed to all States members of the League and also to Germany, the United States, Arabia, Brazil, Costa Rica, Danzig, Egypt, Iceland, Japan, Leichtenstein, Monaco, San Marino, and the Sudan. The Council appointed M. Limburg (Netherlands) president of the conference, and the first meeting will be held on June 8th of this year. A draft convention, which has been twice submitted to the various governments for consideration and criticism, will form the basis for the deliberations of the conference, but it will be open to the delegates to amend or add to it at their discretion. Lord Cranborne, the representative of Great Britain, took exception to a clause in the draft which had been introduced by the committee of experts. This clause would bind the High Contracting Parties to legislate for the severe punishment of those engaged in the "cultivation, gathering and production in contravention of national law, with a view to obtaining narcotic drugs." Lord Cranborne, while agreeing that to make supervision of the drug traffic effective it was necessary to extend it to the "production" of raw materials, regarded the introduction of the clause in question as premature. To meet this objection, which was supported by M. Massigli, the representative of France, the Secretary-General was instructed to ask the various governments for their observations on the new clause introduced by the experts in time for these observations to be circulated before the assembling of the conference. It is to be hoped that the inclusion of the "production" of raw materials may not lead to the difficulties and abstentions which marred the conferences of 1924–25.

TWIN CORONERS?

OUR learned contemporary, the *Law Times*, has published some judicious articles by way of detailed comment on the report of the Departmental Committee on Coroners. In the third and last of these, which appeared last Saturday, it criticises the Committee's recommendation for the creation of a disciplinary tribunal for coroners and also the proposal to confine appointments to solicitors and barristers. On the latter point it observes that the Committee on Coroners does not advocate the dual qualification in law and medicine. How, asks the writer in the *Law Times*, does the lawyer-coroner read the report of a post-mortem examination? He may have served for years as a deputy coroner; he may have taken a course in forensic medicine and may have studied many text-books. But he will never read a post-mortem report with the seeing eye of the medical man who has passed through the hospitals, conducted his own post-mortem examinations, and spent years in post-graduate practice. The coroner, continues the writer, should be able to test the medical evidence out of his own knowledge and experience; otherwise he is at the mercy of the medical witnesses. If a patient has died under an anæsthetic and there has been some carelessness in a matter on which both surgeon and anæsthetist are silent, is the lawyer-coroner likely to detect the fault? The critic finds another advantage in the medical coroner. In the duties of his office the coroner needs to keep in touch with the big hospitals and their staffs, the police surgeons, and the general practitioners of the district. A coroner who is a medical man can talk to other medical men in their own language. Coöperation will be easier and more sympathetic. Coroners have responsibility in the choice between pathologists, police surgeons, and general practitioners for the performance of post-mortem examinations. The proposed institution of a Home Office panel of pathologists for this purpose is dismissed as inadequate to cope with the widespread needs and emergencies. If the coroner's choice remains, it is best exercised by one with medical qualifications.

Having made these points against the Committee's proposals, the writer in the *Law Times* concludes by submitting his own suggestions. As vacancies gradually create the opportunity, he would reorganise large districts under twin coroners. One of the twins would be legally and the other medically qualified. The legal member would take over all the inquests where no medical issue arose; the medical member, who might be called the "medical examiner," would presumably take the difficult medical issues. It is suggested that excellent results might be expected from the collaboration of the best lawyer and the best doctor available for appointment. That may well be; but would not the advantages of such a partnership be more surely and more smoothly obtained if the appointment was given to a single

person who possessed the dual qualification in law and medicine? This dual qualification is already demanded in some of the most important districts. To the General Council of the Bar it is anathema. Apparently the Departmental Committee of Coroners has in this respect yielded to the organised persuasion of the barristers.

CHARLES NICOLLE

Dr. Charles Nicolle, a distinguished bacteriologist possessing an international reputation, has died in Tunis at the age of 70. He was director of the Institut Pasteur de Tunis for more than thirty years, from 1903 till 1936, and editor of the well-known quarterly *Archives* of the Institute, which he inaugurated in 1906. He wrote extensively on the numerous infectious diseases which are endemic in Tunis and many of his researches are of general importance and of permanent value. Among them his greatest achievement was the discovery of the mode of transmission of epidemic typhus, in recognition of which he was in 1928 awarded the Nobel prize for medicine. It had long been known that under insanitary conditions typhus fever spread rapidly amongst prisoners, soldiers, and vagrants, whereas in well-appointed hospitals the disease did not spread. Only those members of hospital staffs were attacked who were occupied in the receiving-rooms or manipulating the patients' clothes and garments, while the clean patients could safely be attended in the general ward. These facts led Nicolle to suspect the body-louse as the vector of the virus and in 1909, in collaboration with Ch. Comte and P. Conseil, he succeeded in proving the correctness of his conclusion by experiments on monkeys. Body lice (*Pediculus corporis*), which had sucked the blood of a monkey infected by the inoculation of blood from a typhus patient, were shown to be capable of transmitting the disease to other monkeys on which they were subsequently allowed to feed. The far-reaching importance of this discovery was demonstrated in an overwhelming manner during the war, when all the armies adopted louse destruction as the essential means of combating epidemic typhus.

From 1909 and until his very last days Nicolle continued his typhus researches, studying the experimental disease in various animal species and the conditions under which it is transmitted. As a result of his experiments with typhus virus and tame rats and mice he formulated a conception of the so-called "inapparent infection," which he defined as an acute infection with periods of incubation and evolution, followed by cure and immunity, though distinguished from the ordinary type of infection by complete absence of general clinical symptoms. In Nicolle's own view this conception is the most important of his discoveries, applicable not only to typhus but also to other infectious diseases (measles, relapsing fever, dengue). Unfortunately his numerous and varied attempts to evolve an efficient method of active immunisation against typhus infection remained unsuccessful. He found, however, in collaboration with Conseil, that serum from typhus convalescents was of prophylactic value, and in 1918, again in collaboration with Conseil, he made the important discovery of the prophylaxis of measles by means of inoculation of serum from convalescents.

Charles Nicolle's fame will not rest merely on his fundamental researches on the transmission of typhus fever by an insect vector, to wit, the louse. This will certainly remain his paramount achievement, in spite of the fact that recent years have revealed the existence in various parts of the world of many clinical types of typhus-like diseases, spread by a variety of insect vectors. Outside his typhus work, however, must be placed to his credit and that of his school a surprising number of notable findings and observations in the field of preventive medicine. We may note, for example, his studies on Mediterranean fever, on kala-azar and oriental sore, on trachoma and soft sore, not forgetting his careful observations on the behaviour and fate of the relapsing fever spirochæte in the body of the louse. An indefatigable worker, he enjoyed the happy collaboration of a band of highly trained experts. The Tunis Institute, in fact, made it its business to illuminate and so to control just those diseases and plagues by which it found itself surrounded. His office of director of a Pasteur Institute, affiliated with the mother institute in Paris and sharing the latter's traditions, he rightly magnified. Only a month ago there appeared in the *Archives* of his institute a long and reasoned article from his pen on the responsibilities of the ideal director of an institute for research in experimental medicine. How is the ideal person to be selected and by whom? By a committee or by a person? When selected and placed in office, what should be his guiding principles in every sphere of his relationships? A pathetic and perhaps prophetic interest attaches to his concluding hints on the training of a successor, a duty that no director, in Nicolle's view, should shirk, if circumstances permit. So studied and ever-progressive should this training in responsibility be, that when the chief comes to retire or die, the change over should take place almost "physiologiquement."

MEASUREMENTS OF RED CELL SIZE

THE Sidney Ringer memorial lecture was delivered at University College Hospital on Feb. 28th on the Measurement of Red Cell Size, by Dr. Cecil Price-Jones. He outlined his technique of measuring red cells and the statistical methods employed to estimate the mean diameter, the degree of anisocytosis, and the degree of microcytosis and megalocytosis shown by the red cells in any sample of blood. He described clearly the normal red cell distribution curve, the factors, such as exercise, that may influence this curve, and the variations from the normal found in pathological conditions.

In introducing the lecturer Dr. Charles Bolton voiced a general feeling in saying that, like Sidney Ringer, Price-Jones had made a remarkable and fundamental contribution to medical science. Ringer's solution and Price-Jones' curves had both become familiar and essential aids to further knowledge of certain physiological and medical problems. Price-Jones has not only devised an invaluable method of studying abnormalities in red cell size but has also determined what the limits of normal variation may be both in size and anisocytosis. These limits are calculated on sound statistical principles and are not the result of a small group of observations only. The method of Price-Jones is admittedly time-, if not temper-, consuming, but it has the extreme advantage over most other methods that the limits of normal variations in cell size determined by the method are known. Mean corpuscular volume can also be used as a measure of cell size. Price-Jones and his colleagues [1] have recently determined the normal limits of variation in cell volume by the method of

[1] Price-Jones, C., Vaughan, J. M., and Goddard, H.: Jour. Path. and Bact., 1935, xl., 503.

Wintrobe. The method is quick, accurate, and easily carried out. It will probably prove the method of choice in the future for estimating cell size in routine investigations. It has however the great disadvantage that it gives no expression to the degree of anisocytosis present in the sample. Increase in anisocytosis is a more delicate measure of variation from the normal than increase or decrease in mean corpuscular size. For research purposes a method that estimates both cell size and anisocytosis is essential. Pijper [2] claims that his new diffraction apparatus will give reliable measurements both of diameter and anisocytosis; its great advantage is the speed with which results can be obtained; it should be a useful aid in the routine laboratory, especially when the limits of normal variation by this technique have been determined on statistical principles. No diffraction method, however, will give mathematical expression to the degree of microcytosis and megalocytosis present. Though diffraction methods of a refined type and estimations of cell volume may have their value in routine blood examinations, at present the Price-Jones' technique, especially when used in conjunction with Wintrobe's method of volume estimation, stands alone as a method sufficiently accurate for research purposes. It has already achieved, in the hands of its originator, results of fundamental importance.

FOG AND FILTHY AIR

THE public is loudly exhorted in the daily press to become air-minded; and we hope that its new air-mindedness will include concern at the condition of the air. The twenty-first annual report on investigation of atmospheric pollution, issued by the Department of Scientific and Industrial Research,[3] shows that the air over the country generally is not becoming cleaner; at least it is not becoming cleaner at those places where deposit gauges have been installed long enough for comparisons. Out of 57 such places only 5 show improvement during the year ended last March. Nor is this the whole tale; for a survey by Mr. B. H. Wilsdon shows that in the past twenty years the amounts of insoluble matters deposited have shown no progressive improvement, although the soluble matters lessened during the first eight years of the investigation. Last year the incidence of days of fog haze, when the soot stain produced by filtering air through paper reached a depth corresponding to over 2 lb. of soot in a cube of air with 100-yard sides, was very variable in places where Owens' air filter records were taken. In London only 19 such "Z" days were recorded at South Kensington and Westminster Bridge, whereas at Victoria-street 52 were noted and at Westminster City Hall 115. At Kew there were 15, at Cardiff none, at Coventry 22, at Stoke-on-Trent 141, and at Edinburgh 68. The irregular distribution over the small area of London covered by filter records is consistent with common experience of the patchy incidence of fogs.

Particular attention has been devoted of late years to the sulphur content of the air, determinations being made at many stations of either the actual volume ratio of sulphur dioxide in air—which is of the order of less than 1 in a million—or of the weight of active sulphur dioxide absorbed by an area of 100 sq. cm. of a lead peroxide surface exposed under a hood protecting it from rain and renewed after a month's exposure. In all places the variation from month to month is conspicuously seasonal, sulphur, like all polluting matters except those which are insoluble, being in greater amount in air in winter than in summer; but in London, as well as other towns, the amounts in both summer and winter are large, suggesting either that the domestic coal fire is widely continued through the summer or that the southward movement of industrial undertakings is having its effect on London air. This latter view is put forward by a member of the research committee, Mr. J. H. Coste, chemist to the London County Council. Whether it adequately explains the high sulphur content of London air it is difficult to judge; but the annual consumption of coal in the metropolis is very large and there is little reason to suppose that this coal is of specially low sulphur content. So far as we know, the undertakings in London which take steps to remove sulphur from flue gases can be counted on the fingers of one hand.

[2] Pijper, A.: THE LANCET, 1935, i., 1152.
[3] London: H.M. Stationery Office. 1936. 5s.

EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS

A FEW months ago we referred [1] to the work of Dr. Jacques Arnaud, medical director of the Sanatorium Grand Hôtel du Mont Blanc. It may be recalled that his prescription for the early diagnosis of pulmonary tuberculosis was systematic, periodical radiographic examination of the whole community. The same plan is now recommended independently by another tuberculosis specialist in another country. In *Tidsskrift for den Norske Laegeforening* for Feb. 1st, Dr. H. J. Ustvedt passes in review 321 patients examined in the Ullevaal Hospital in Oslo, and gives the duration of the symptoms of these patients before they submitted to a medical examination. It seems that only 83 of them came to examination within a fortnight of the first appearance of symptoms, and that the latent period was three months or more in the case of another 83. Though cough and fever may mark the onset of the disease for the patient, they represent in the eyes of the clinician and pathologist comparatively late stages of an infection which may date back many months, and the disease will be recognised early only when it is sought among persons believing themselves to be perfectly well. Ustvedt therefore recommends Pirquet tests followed by X ray examination of the positive reactors. This system has already been started tentatively in the homes of the tuberculous in Norway, and in Oslo medical students are thus systematically examined with the same object. The procedure is shortly to be extended to other groups so that students in all the faculties can enjoy its benefits. With regard to tuberculin tests, it is curious that whereas in Denmark and Sweden the Pirquet reaction has been found to be so inferior to the Mantoux reaction that the latter is now given the preference in wholesale tuberculin examinations, Norwegians still cling to Pirquet, being convinced that, when it is practised lege artis, it yields figures within 90–95 per cent. of Mantoux figures with 1 mg. of tuberculin. In the other Scandinavian countries comparisons of the two reactions have been much less flattering to Pirquet. These intra-Scandinavian discrepancies may reflect want of uniformity of technique, or, as Ustvedt believes, the fact that bovine tuberculosis exists in Denmark and Sweden but is almost non-existent in Norway.

[1] THE LANCET, 1935, ii., 1123.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XCI.—PROGNOSIS IN SPINAL CARIES

PROGNOSIS in spinal caries depends (1) on the natural resistance of the patient, (2) on the method of treatment adopted, and (3) eventually on complications and the degree of deformity remaining. The disease may occur at any age and is most dangerous in weakly infants with bad family history, in whom the danger of tuberculous meningitis or general dissemination is very real. There is much controversy as to the relative values of extreme conservatism without operation and conservative treatment assisted by bone-grafting or bone-fusing operations of that part of the spine affected. The position is, briefly, that properly applied conservative treatment with rational orthopædic measures but without operation is certain of considerable success, but that treatment may be shortened in selected cases by operative measures. Immediate mortality is undoubtedly least when careful non-operative conservative treatment is alone applied. Patients with severe deformity, which incidentally should never arise if early treatment is undertaken, have a lessened hope of longevity from mechanical reasons which predispose to death from complications such as pneumonia. Such patients however can hardly be helped by operative treatment.

Below are tables giving mortality statistics of all my own cases treated at Treloar Cripples' Hospital from September, 1908, to March, 1935, but excluding cases in private practice or treated at any other hospital with which I am associated.

SPINE

Total number of cases admitted during the period	1666
Cases discharged to March 31st, 1935	1582
Deaths to March 31st, 1935	61 (3·8%)
Average stay in hospital of fatal cases	410 days.

Causes of Death

Miliary T.B. and meningitis	32 (2·02%)
Sepsis and amyloid disease	16 (1·01%)
Other causes	13 (0·82%)

Diphtheria	1	Pneumonia	1
Morbus cordis	3	Broncho-pneumonia	1
Nephritis	1	Influenzal pneumonia	1
Ketosis	1	Intestinal obstruction	1
T.B. carditis	1	Hæmorrhagic measles	1
Post-operative shock (laminectomy)	1		

Age-periods.	Deaths.	Average stay in days.	Miliary T.B. and meningitis.	Sepsis and amyloid.	Other causes.
1– 5	26	257	19	2	5
6–10	26	592	11	8	7
11–16	9	466	2	5	2

Relative Frequency of (a) Miliary T.B. and Meningitis, and (b) Sepsis and Amyloid Disease as Causes of Death at Different Age-periods in Spinal Caries

Age	1–5	6–10	11–16
Miliary T.B. and meningitis (per cent.)	73·1	42	22·2
Sepsis and amyloid (per cent.)	7·7	30	55·6

Summary

	Total admitted.	Total discharged.	Total died.	Average stay in days of fatal cases.	Death percentage.
Spine	1666	1582	61	410	3·8

Mortality is highest in the age-period 1–5 and the commonest cause of death in this age-period is meningitis and general tuberculous dissemination. As age increases the danger of meningitis diminishes, but deaths from sepsis increase. Other causes may be almost disregarded, as they are incidents arising in any child's life though naturally more serious in a child already infected with tuberculous disease.

This comparatively low mortality in children, many of whom arrive for treatment with advanced disease, often complicated by abscess or sinus formation and sometimes paraplegia, may be ascribed to the rigid conservatism practised under exceptionally good climatic and hygienic conditions. In children I am definitely opposed to stabilising the spine by bone-grafting or fusing while the disease is active and consider such operations not generally indicated when the disease is arrested. An exception to this rule occurs in the case of children of poor musculature where it may not be possible to supervise efficient splinting over a sufficiently long period after discharge. In such cases rapid increase of deformity may arise, which might be avoided by osteo-synthesis.

In adolescents and adults Albee's operation (or some modification) for stabilising the spine is increasingly popular amongst many surgeons as an alleged means of reducing the period of treatment for and the danger of later increase of deformity or recurrence of the disease. The mortality is undoubtedly raised in those submitted to operation unless patients are carefully selected, guarded from intervention in the acute and progressing stage of the disease, and made to take adequate rest over a sufficiently prolonged period.

These operations will not with certainty arrest the disease and in the course of my work I have been impressed by the large number of patients I see who had been discharged too soon and in whom abscesses or paraplegia had compelled return to institutional treatment, often without the knowledge of the surgeon who performed the operation.

COMPLICATIONS

The presence of a *closed tuberculous abscess* associated with a tuberculous lesion of the spine is of little moment if it can be successfully aspirated and secondary infection or sinus formation avoided. If secondary infection occurs the outlook is grave. Free drainage is essential and immediate treatment with autogenous vaccines at this stage is helpful. All too often, however, fever and toxæmia enfeeble the patient, the course of treatment frequently becomes long and tedious, and amyloid disease may follow. In the latter case, the prognosis is definitely bad, though I can recall a few such patients who have recovered. Secondarily infected sinuses often heal with extreme difficulty, some never heal, and then the patient may recover or survive for many years with discomfort and often, though not necessarily, in a state of chronic invalidism.

An abscess is a serious complication when it forms in the region of the spinal canal and when by reason of the pachymeningitis it produces, or by direct mechanical pressure, it involves the spinal cord. The mid- and upper dorsal regions of the spine are the commonest situations. Of 134 cases of paraplegia occurring at the Treloar Cripples' Hospital, 14 are still under treatment, 5 died, 6 were removed, 24 were unimproved, and 85 were discharged walking after conservative treatment.

Paraplegia from true tuberculous pachymeningitis is a late manifestation; its onset is insidious, it tends to progress rather than resolve and the prognosis is bad. Of 26 such cases included in the total of 134, 12 recovered, 11 were unimproved, 2 were removed, and 1 died.

DEFORMITY

The prevention of deformity, or its correction, if that is possible, should be an essential aim in treatment. Both may be ensured in a large number of cases if the patient is immobilised, hyperextended, and treated at first and for many months in the dorsally recumbent position. The cervico-dorsal region of the spine is the most difficult one in which to prevent or correct deformity, and if much deformity exists before effective treatment is initiated, correction is almost impossible. The prevention or attempted correction of deformity should be urged not only on æsthetic grounds, but because with much kyphosis there is embarrassment and displacement of the viscera, especially the thoracic viscera, with consequent distress to the patient and liability of intercurrent, especially respiratory, disease. A strong dorsal musculature is of great assistance in maintaining the spine erect, and for that reason open-air treatment and back-raising exercises with the patient prone are of especial value in the last stages of institutional treatment. Efficient after-care and well-applied and fitting spinal jackets are of immense importance at this period, and in cases of weakened muscles spinal osteosynthesis has its most important indication.

ASSOCIATION WITH OTHER TUBERCULOUS LESIONS

Occasionally, though rarely, one finds patients who will fail to respond to any form of treatment and in whom other lesions develop. For these, prospects of recovery are poor, though, at times, from some reason, possibly a suddenly acquired immunity, progress of the disease is checked and recovery follows.

In children, multiple lesions associated with spinal caries lengthen the period of treatment required but do not usually jeopardise cure. Associated pulmonary tuberculosis is a serious but not unconquerable complication, and I have known adults who, as the result of acquiring spinal caries following pulmonary tuberculosis, have recovered completely from both, largely as the result of the enforced rest which the spinal lesion necessitated.

I am indebted to Mr. H. H. Langston, R.M.O., at the Treloar Hospital, for collecting and analysing the incorporated statistics, and to Dr. Churchill, late R.M.O. to the hospital, for the analysis of the paraplegia cases which is discussed fully elsewhere (*St. Bartholomew's Hosp. Jour.*, October, 1935).

HENRY GAUVAIN, M.D., M.Chir., F.R.C.S.,
Medical Superintendent of the Lord Mayor Treloar Cripples' Hospitals, Alton and Hayling Island, and of the Morland Clinics, Alton.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. H. H. Babington to *Pembroke*, for R.N.B., Chatham, and as Ophthalmic Specialist; M. Brown to *Victory* for Haslar Hospl.; and O. D. Brownfield, O.B.E., to *Pembroke* for R.N. Hospl., Chatham.

Surg. Lt. (D) S. R. Wallis to *Pembroke* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. B. H. Wyatt placed on the Retd. List.

Surg. Lt. C. J. T. Watson to *Curacoa*.

Surg. Sub-Lts. J. A. Shepherd to *Royal Sovereign*, and R. F. B. Bennett to *Victory* for R.N. Hospl., Haslar.

Proby. Surg. Lts. to be Surg. Lts.: A. B. Concanon, W. G. Gill, and N. A. Vernon.

Proby. Surg. Sub-Lt. G. S. Irvine to be Surg. Sub-Lt.

ARMY MEDICAL SERVICES

Lt.-Col. S. W. Kyle, R.A.M.C., to be temp. Col. whilst empld. as A.D.M.S., 5th Div., Jan. 10th, 1936. (Substituted for notification in the *Gazette* of Feb. 4th.)

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions: Lt. B. d'E. Barclay to be Capt; Lt. (on prob.) A. H. T. F. Fullerton is restd. to the estabt. and is confirmed in his rank; and R. E. Waterston to be Lt. (on prob.).

REGULAR ARMY RESERVE OF OFFICERS

Col. E. W. Powell (late R.A.M.C.), having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY

Capt. A. N. B. Odbert to be Divl. Adjt. 46th (N. Mid.) Div., vice Maj. H. A. Rowell, M.C., vacated.

Lt. P. Spence to be Capt.

The King has conferred the Efficiency Decoration upon the undermentioned officers under the terms of the Royal Warrant dated Sept. 23rd, 1930: Lt.-Col. J. P. Clarke, Lt.-Col. J. B. Scott, M.C., Maj. A. H. D. Smith, M.C., Maj. A. G. Williams, O.B.E., Maj. P. Lloyd-Williams, Maj. C. W. Healey, M.C., and Maj. James Duncan Hart, M.C. (deceased).

TERRITORIAL ARMY RESERVE OF OFFICERS

Lt. A. Menzies, from T.A. Res. of Off. (9th Bn. A. and S.H.), to be Capt.

ROYAL AIR FORCE

Squadron Leader T. J. X. Canton to R.A.F. Station, Manston, for duty as medical officer.

Flight Lt. J. Hutchieson is promoted to the rank of Squadron Leader.

Wing Comdr. J. Rothwell is placed on the retired list at his own request.

Flying Officer S. R. C. Nelson to No. 6 Flying Training School, Netheravon.

Dental Branch.—Flight Lt. J. E. Willoughby, L.D.S., relinquishes his non-permanent commission on account of ill-health.

INDIAN MEDICAL SERVICE

Capt. G. J. Joyce to be Maj.

DEATHS IN THE SERVICES

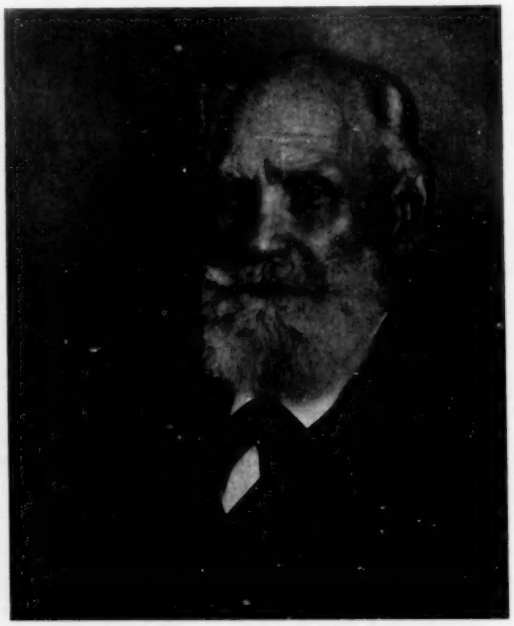
The death occurred at Tunbridge Wells on Feb. 27th of Surgeon Captain JOHN EDWIN COAD, R.N., retd. He qualified M.B. Durh. 1885 and M.R.C.S. Eng. 1886, having been educated at Newcastle-on-Tyne and St. Thomas's Hospital, London. In 1887 he resided at York and soon after joined the Navy. In 1899 he was appointed Staff Surgeon in *Barracouta*, a twin-screw cruiser, Cape and West Africa Service, attained the rank of Fleet Surgeon in February, 1903, and retired with the rank of Surgeon Captain in July, 1917, receiving a medal for war service.

LONG RECORD OF HONORARY SERVICE.—At a meeting of the executive committee of Worcester Royal Infirmary to consider the appointment of a successor to Mr. Mark Bates, who is an honorary surgeon but is undertaking other work at the hospital, it was stated that the Bates family had in all given 77 years of honorary service to the hospital. The late Mr. Tom Bates gave 37 years' work, his son, the present senior surgeon, has given 27 years, while Mr. Mark Bates has given 13 years.

SPECIAL ARTICLES

IVAN PETROVITCH PAVLOV

DURING the last twelve months of Pavlov's life probably more people who were interested in his work had the privilege of seeing him and hearing him speak than in any other year. The summer of 1935 is memorable both because of his visit to this country for the International Neurological Congress and because of the holding in Russia of the International Physiological Congress. The name of the great physiologist dominated these gatherings, which were attended by representatives from all over the world, and their chief interest to many lay in the opportunity to "see Pavlov." Those who met him on these occasions must count themselves fortunate, for he died in Leningrad on Feb. 27th, at the age of 86.



Pavlov was born in September, 1849, in the small city of Riazan in Russia. His family were poor, but his father was a country priest and the foundations of his education were laid in the church school from which he passed to the theological seminary. It seems that this differed from other schools in that the boys were encouraged to develop their natural inclinations instead of being forced up to the same standard in all subjects. Pavlov became interested in the natural sciences, and at the age of 21 entered what was then St. Petersburg University, and studied under Mendeleef and other eminent teachers. Later, in the Medico-Chirurgical Academy, he came in contact with von Cyon whose stimulating personality had much to do with determining his future career; and after graduation in 1879 he continued research work in the Military Medical Academy under the physician Botkin, obtaining the degree of M.D. in 1883 for a thesis on the efferent nerves to the heart. In 1884 came the opportunity to go abroad, and when he returned to his former position two years later his experience had been enriched by work done in the laboratories of Ludwig and Heidenhain.

Thereafter followed his classical contributions to the physiology of digestion, and by 1897, when he published a monograph on the subject, his reputation was international. Meanwhile, at the age of 41, he had been appointed professor of pharmacology in the Medical Academy, and then to the chair of physiology in the new Institute of Experimental Medicine, built by Prince Alexander of Oldenburg. In 1897 he obtained the chair of physiology in the Medico-Chirurgical Academy, relinquishing his professorship of pharmacology, but he still retained his other two posts when, in 1907, he was appointed one of the four scientific members of the St. Petersburg Academy of Sciences, and therefore had charge of three laboratories. Most of his personal research was done in the Institute, now known as the All-Union Institute of Experimental Medicine, of which he was latterly honorary director, as well as director of physiological laboratories in the Russian Academy of Sciences.

Although Pavlov emerged after the revolution in more or less the same posts as he had held previously, he suffered more than a change of titles during that difficult time. "Like other scientists he suffered much . . . having to carry on his experiments without heat or light, and drawing his main food supply from a little patch of potatoes which he tended himself. But his only complaint was that, with other members of the Academy of Sciences, he had to take his turn in guarding firewood stacked outside the Academy for six hours at a stretch." [1] Pavlov, however, was no stranger to hardship and was enabled to survive this period of drudgery and want which must have recalled his earlier struggles. Until he obtained his first professorial post his life had been a continual battle with poverty and difficulties which to a lesser man would have been insurmountable. The animals he used for his researches into the circulation and for his earlier experiments on digestion were tended by himself and his wife in their own home, and comfort was sacrificed to the thoroughness upon which he insisted in every branch of his work. During his second period of adversity he made no secret of his disapproval of the prevailing régime and its principles, but he was treated with tolerance and later received at the hands of Lenin every encouragement and opportunity to pursue his important work. It would be ungenerous to analyse the motives for this policy, which was never varied up to the time of Pavlov's death. Last year, on his 85th birthday, he was given a pension of 20,000 roubles, and a million roubles for his laboratories. He had but little interest in politics as such, and it is said rarely read a newspaper. He criticised the government in so far as they made academic appointments on political grounds, and more fundamentally because he believed the philosophy they adopted to rest on a faulty biological basis; nevertheless, in his welcome to the Physiological Congress last year he fully identified himself with the policy of his country.

Long after these details of Pavlov's eventful career have been forgotten his contributions to medical science will perpetuate his name. In the space of ten years he reduced the unexplored field of digestive secretion to an orderly pattern of reflexes,

[1] The Times, Feb. 28th, 1936.

and definitely established the value of applying to physiology the methods of aseptic surgery. His fistulæ were carefully made, and the scrupulous after-care of the animals enabled him to keep them alive until they were, to all intents and purposes, restored to normality. The influence of experimental conditions upon his observations was reduced to a minimum. The importance of his famous operation for separating off a pouch from the stomach, in which the gastric secretion could be studied uncontaminated with food, rested upon the "normality" of the pouch. Its nerve- and blood-supply were left intact, and no detail was overlooked which would serve to make it in all respects a faithful miniature of the stomach itself. Pavlov never made the mistake of forgetting that the organ he was studying was but a part of the whole animal, and that if this was not in perfect condition the conclusions would be subject to all manner of reservations. He worked out in great detail the responses of the salivary and gastric glands to the sight, smell, and taste of food, and showed how the type and quantity of secretion could vary with the kind of food administered.

THROUGH PHYSIOLOGY TO PSYCHOLOGY

It is noteworthy that although Pavlov's work had been directed up to this time towards problems concerning the circulatory and digestive systems, he approached them from the point of view of their nervous control. In 1902 Bayliss and Starling demonstrated the copious secretion of the pancreas in response to the hormone secretin, and Pavlov had to revise many of his conclusions in view of this hitherto unsuspected mechanism for coördination. He foresaw that development for the next few years would be likely to be along chemical lines, and it is probable that his disinclination for this type of work was one of the factors which turned his attention to the nervous system itself.

At all events, the next thirty years saw a direct attack on the physiology of the cerebrum whose results transcended in importance anything which Pavlov had yet done. He noticed that an organ could be activated reflexly not only by its normal stimulus, but, under certain circumstances, by all kinds of stimuli not usually associated with it. Thus if a dog was always fed in a routine manner by the same attendant, dressed in the same way, it would begin to secrete saliva before tasting the food, and also when the attendant came without food. In other words an entirely new reflex—a conditioned reflex—had been laid down, the sight of a particular person becoming an adequate stimulus for the secretion of saliva. A salivary fistula enabled Pavlov to assess the quantitative value of the response by measuring the rate of secretion, and he showed how this could be brought about by stimuli applied to any sense-organ. Once the method of producing conditioned reflexes had been established, the next step was to investigate their properties—how they were modified by intercurrent stimuli and the laws determining how they could be reinforced, destroyed, or inhibited. The fruitfulness of experiments on inhibitory phenomena alone was surprising, and Pavlov showed, among other things, how inhibition could be built up so strongly as to produce sleep.

The technique of the experiments is further illustrative of Pavlov's genius in obtaining reliable information about a single organ from the intact animal. This time the problem was not surgical, but rather one of designing apparatus and perfecting routine. The brain was "isolated" by keeping the animal under absolutely constant conditions and ensuring that the experimental stimuli to which it was subjected were the only unusual events in its life. This required extraordinary precautions including the building of special laboratories and the rigid training of assistants. It might have been contended, with some show of reason in regard to his earlier experiments on digestion, that Pavlov owed his success to his amazing manual dexterity and operative technique, which were the envy of his assistants. In considering his work on conditioned reflexes, however, it becomes apparent that the factor determining the outcome of his researches was always his method of attacking a problem. His life was literally devoted to the search for truth, and in achieving his ends he used no instrument which he had not perfected to the highest possible degree. "A superb experimenter, combining the talent of a magnificent surgeon and a shrewd observer; a dynamic lecturer, surpassed only perhaps by Maximot in logic and the use of language; a powerful thinker, never interested much in priority, never influenced by any authority, he understood only the logic of facts."[2]

It is unnecessary nowadays to stress the value of this objective method of approach in the study of the mind. Pavlov believed that all acquired habits and training depended on chains of conditioned reflexes, and that his experiments on dogs provided the clue to the type of activity taking place in the human cortex. By comparing the reactions of different animals to his experiments, the readiness or otherwise with which they formed conditioned reflexes, and the subsequent stability of the reflexes, he was able to divide dogs into four groups which bore a close resemblance to the "choleric, phlegmatic, sanguine and melancholic" temperaments of man. By associating one kind of response with a conditioned stimulus of certain characteristics, and an incompatible type of response with a closely related but slightly different stimulus, he trained his dogs to an astonishing pitch of discriminative ability. If overtaxed, for instance by persistently having to differentiate between two musical notes varying by only a few vibrations, they broke down and became definitely neurotic, losing temporarily all vestige of their training. Inhibitory reflexes were always the greatest sufferers under such conditions.

Clearly this was leading Pavlov into the realms not only of normal but of abnormal psychology. He related the original "type" of dog to the disturbance most likely to develop, and was able to produce states analogous to hysteria, catalepsy, and many of the neuroses and psychoses. Visitors to Leningrad last year were able to see the groups of orphan babies whose development he was observing, and the patients he was investigating in the Psychiatric Polyclinic where he had charge of 25 beds.

A LEGACY TO SCIENCE

The logical development of Pavlov's work has never faltered, and at the time of his death he was the centre of a vast and still growing organisation of research which had sprung from his first modest experiments. It is doubtful whether the usefulness of the methods he has introduced will ever be exhausted, while the results so far attained have already made a permanent impress on several branches of learning, including some previously immune to experiment.

[2] Stavraky, G. W.: Arch. Neurol. and Psychiat., 1935, xxxiii., 1082. Most of the biographical data in the present sketch were obtained from this account of Pavlov's life. The photograph was taken at the Rockefeller Institute, during a visit to New York, by Mr. Louis Schmidt.

His powerful, yet lovable personality, will not be forgotten by those of the present generation, while the intense loyalty and admiration he evoked in all who worked with him bids fair to make that personality legendary. Known in every civilised country in the world, he was awarded many foreign and international distinctions, including the Nobel Prize in medicine and physiology in 1904. In this country he was a foreign member of the Royal Society, whose Copley medal was given to him in 1915, and an honorary fellow of the Royal College of Physicians.

MEDICINE AND THE LAW

The Nottingham Nursing-home Trial

Nurse Waddingham, an unregistered nurse, was found guilty last week of the murder of Ada Baguley at a home carried on at Devon-drive, Sherwood, Nottingham. In the organs of the dead woman's body 4½ grains of morphine hydrochloride were found. One grain was a possible fatal dose. The jury may well have been satisfied that Ada Baguley died on Sept. 11th of morphine poisoning: they had also to be satisfied that the accused administered the morphia and administered it with intent to murder. A will made by the deceased on May 7th in favour of the accused was suggested as a motive. When told, on Sept. 24th, that morphia had been found in the body, Nurse Waddingham said: "I have never given Miss Baguley any morphia: I have never had any in the house. . . . Apart from the medicine prescribed by the doctors and aspirin, she has had no other medicine." Later she admitted that she had morphia, but she said that Dr. Manfield (the deceased's medical attendant) had prescribed it and she had not mentioned the fact because he asked her not to. This statement Dr. Manfield denied. There was a further vital conflict of evidence between the accused and the medical attendant. The accused said that on August 27th Dr. Manfield gave her 6 tablets which she knew were morphia. Dr. Manfield said that he did not and that there was nothing in the patient's condition which would lead him to leave morphia at the home. Inasmuch as the defence contended that the accused administered the morphia to alleviate violent pain, it was important that Dr. Jacob, who had attended Miss Baguley previously, visited the patient in the third week of August and saw no reason to prescribe morphia. The drug indeed, according to the accused, was mentioned for the first time on August 27th. She said that on Sept. 2nd Dr. Manfield gave her 4 more tablets of morphia, without being asked and without asking whether she had used any of the previous 6. Dr. Manfield denied this too. Nurse Waddingham said she had given the first two tablets to the deceased on Sept. 7th. She said Miss Baguley had been poorly from some date in August and one of the symptoms was a severe abdominal pain. She gave the morphia tablets for three nights because Ada Baguley suffered sharp abdominal pains, yet on Sept. 10th she cooked her a heavy meal of pork (two helpings), baked potatoes, kidney beans, and fruit pie. The patient died next morning. Dr. Manfield was sent for: he found the body still warm: rigor mortis had not set in. He certified cerebral hæmorrhage as the cause of death. This, as the post-mortem examination showed, was wrong. Mr. Justice Goddard remarked that no blame could here be attached to the doctor for the error. If a patient dies of a stroke, the doctor can act on what he is told and he can but ask those who were present at the death and form his own opinion. The doctor was dealing with a patient suffering from a disease with which apoplectic disorders could be connected, and he was told that she had suffered from strokes before. There were, as the judge observed to the jury, many points at which the evidence was in Nurse Waddingham's favour. The inconsistencies in her story and the conflict between her evidence and that of Dr. Manfield seem to have established her guilt.

One point of special significance was the introduction of evidence that Ada Baguley's mother, an inmate of the same home, had apparently died of a poisonous dose of morphine. Dr. Roche Lynch described the discovery of pseudomorphine in her exhumed body. How was this evidence of another death legally admissible on the charge in respect of Ada Baguley alone? We noted in this column a few weeks ago the case of R. *v.* Mortimer, where a soldier who stole a car ran down a girl on a bicycle and was charged with murder. Although strictly the witnesses should have spoken only of this incident, the court admitted evidence that, earlier and later, the soldier had driven the car at other people on bicycles. These facts were held to be admissible in order to show systematic purpose and to negative the defence of accident. So also in the Baguley trial the evidence of a parallel case was allowed in order to prove intent. The jury was warned (for what such warnings may be worth) that the evidence of Mrs. Baguley having died of morphine poisoning was not to be accepted by them as showing that Nurse Waddingham was a woman who poisoned other people. The evidence of the mother's death was material, said the judge, only in this way—if the jury thought the administration of morphine to the mother might not have been innocent, they could ask themselves whether the giving of the drug to the daughter was done with the innocent intention to relieve pain or with the criminal intention of taking life. Whether juries can master these subtleties or no, such is the law. The same point arose in the Armstrong case in 1922. On a charge of murder by arsenical poisoning in the month of February, it was proved that the prisoner had arsenic in his possession both before and after that date. His defence was that death was due to suicide and that his possession of arsenic was for the innocent purpose of killing weeds. Evidence that he tried to poison somebody else with arsenic in October was held admissible as tending to show that the possession of the weed-killer at the earlier date was not for an innocent purpose.

There is to be an appeal in R. *v.* Waddingham. It has been stated in the daily press, on the authority of the solicitor for the defence, that one ground of appeal will be the fact that the judge told the jury it was either murder or nothing and did not deal with the possibility of manslaughter through the negligent administration of morphia to the patient. The discussion on this and other points must be awaited.

Hospital's Liability for Child Patient

A verdict of £500 damages (with costs) was entered last week against the Rochester and Chatham Joint Hospital Board, as managers of St. William's Hospital, Rochester, in an action for damages for personal injuries to a child patient. A boy of 7 was received in the scarlet fever ward on the ground floor. On the afternoon of his first day in the ward, having been placed in a bed a few feet from a window, the lower part of which was open, he somehow sustained

injuries by falling out of the window to the ground below, a distance of about 17 ft. He suffered from shock and was kept three weeks longer in hospital; his forehead was disfigured and both feet are now flat and require special supports. The boy's father, who brought the action, said the hospital and its staff were negligent in leaving the patient unattended near the open window. The defendants denied the allegation and alternatively contended that, if they had been negligent, the child had jumped out of the window in the endeavour to return home, taking the risk of the jump and contributing by his own negligence to any harm which he received. The verdict of the jury indicates that they did not accept the contention of contributory negligence.

There are interesting legal decisions on the question whether, or how far, a child is capable of negligence. Lynch *v.* Nurdin (1841) is the classic case. An egg-merchant's cart was left unattended beside the pavement in Compton-street, Soho. Children played with it. One little boy was climbing into the driver's seat when another little boy tugged at the horse's bridle. The first boy consequently fell and was injured; his father successfully claimed damages and it was considered that the child had not been guilty of contributory negligence but had merely obeyed a child's natural instincts of play. The inference is that a child in such cases is to be judged as a child and must not be expected to have the mature judgment of a grown-up person. On the other hand he may be unable to recover damages if he has done what he knew to be naughty. The jury must consider his age and his ability to look after himself. Where a machine for oil-cake crushing was left standing in the street with the handle not fastened up and some schoolboys played with it, one turning the handle while another thrust in his fingers, the owner of the machine was held not liable. This decision has been severely criticised. Modern cases are more sympathetic to the child, where the object is dangerous in itself, especially when it offers some allurement to the infant mind. Special considerations arise where the child meets its injuries while trespassing. The Central London Railway, for instance, had a moving staircase in a booking-hall close to the street. It attracted children from the street, who were frequently driven away. One child was injured while thus trespassing and the court held that the company was not liable. As regards the duty of hospital staff to foresee the natural temptations of an open window near a child's bed, the same duty would presumably exist in the case of an adult patient of known abnormality of mind.

Fines for Dangerous Drugs Act Offence

Last week the Marylebone magistrate imposed fines amounting to £150, with 30 guineas costs, upon a physician and surgeon for failing to keep records as required by the Dangerous Drugs Regulations. The prosecution concerned 398 grains of morphine sulphate. It was said that the defendant had given one woman 190 grains at one time and another person 72 tubes. Both these patients were known to be drug addicts. It was further said that the prescriptions showed that the doctor, rather than reduce the dosage, had been increasing it; 1 grain had been increased to 7 or 10 grains in a few months. Counsel for the defence submitted that the large supply in one instance had been for a patient who was going on a cruise. The magistrate said it was a case of such gravity that, if the money was not paid by the end of the day, the alternative would be imprisonment.

THE IRISH HOSPITALS

(FROM OUR DUBLIN CORRESPONDENT)

After the passing of the Public Hospitals Act, 1933, the Minister for Local Government and Public Health appointed a commission, under the chairmanship of Mr. Michael W. Doran, to investigate the hospital and nursing facilities existing in the Irish Free State, to advise him as to the improvement of such facilities, and generally on any matter relating to the administration of the Hospitals Trust Fund. The first general report of the commission was issued last Saturday, and is attracting much attention both from the public and the medical profession. The commission has shown industry, insight, and vision in its work, and has made a thorough and discriminating investigation of the whole hospital problem. The acceptance or rejection of the recommendations in the report is a matter for the Minister, but the report will always be of value as a historical document, both for its survey of the present position and its suggestions for the future. It is a closely printed volume of over 200 pages and only a brief abstract can be given here.

HOSPITALS IN THE FUTURE

The hospital system which the commission visualises for the future would consist of district hospitals, county hospitals, and regional hospitals. The district hospitals, of which there might be several in a county, would deal with such acute medical cases and receive maternity and surgical cases as could properly be treated without special services of any kind. The county hospitals—one in each county remote from a regional hospital—would cater for acute medical and surgical cases. Regional hospitals would be at the teaching centres of Dublin, Cork, and Galway, and also at Limerick and possibly at Sligo. They would deal with acute or obscure medical and surgical cases.

CONDITIONS IN DUBLIN

A careful survey is given of the existing facilities in the several centres, and a discussion follows of the improvements and additions considered desirable. The problem of Dublin is of most interest. In the opinion of the commission the number of general hospitals in Dublin is too large, and many of the hospitals are too small, the number of beds ranging from 40 to 399, excluding the poor-law hospital which has 1582 beds. The commission recommends that the ten clinical hospitals should be reduced to seven by the amalgamation of four hospitals on the south side of the city—the Meath, Mercer's, Sir Patrick Dun's, and the Royal City of Dublin. Of these four the three last mentioned have put forward a scheme of amalgamation, and in regard to the Meath, the commission does not think that its obligations are sufficient to exclude it from the scheme, and advises against any large expenditure on it should it remain independent. St. Vincent's Hospital has considered removal from its present site in St. Stephen's Green to a site on the outskirts of the city, and should be considerably enlarged. The commission is not concerned with the Adelaide Hospital which has not applied for any grant from the Hospitals Trust Fund. The commission does not recommend any interference with Dr. Steevens' Hospital, the only remaining hospital on the south side of the city, its location and the nature of its activities rendering its inclusion in a scheme of amalgamation inadvisable. On the north side of the

city the Richmond Hospital and the Mater Misericordiæ Hospital should both be considerably enlarged. The Charitable Infirmary (Jervis-street Hospital) should remain to carry on its work as at present, being in fact the principal accident hospital of the city. To sum up, the scheme provides for four hospitals of 550 beds each, two on the north side and two on the south, together with Dr. Steevens' and Jervis-street, and presumably the Adelaide, as at present. It is further recommended that these voluntary hospitals should take over the care of such acute cases as are at present given care in the poor-law hospital.

FEVER HOSPITALS—ACCOMMODATION FOR TUBERCULOUS CASES

The commission proposes the abolition of the fever wings attached to certain of the voluntary hospitals and the abandonment of the present fever hospital in Cork-street in favour of a new fever hospital to be built in or near Dublin. This proposal has already been approved by the Minister who has introduced a Bill to the Dáil to give it effect. It is not intended to amalgamate the three maternity hospitals of Dublin. One of them, the National Maternity Hospital, has just completed a new and greatly enlarged building. Enlargement of the Rotunda is recommended, and the abandonment of the present building of the Coombe with its removal and rebuilding on the site now occupied by Cork-street Hospital.

With regard to hospital accommodation for tuberculosis, the commission declares that there is a definite shortage of bed accommodation in the country, both for pulmonary and for non-pulmonary cases. The report recommends an open-air unit of 100 beds at Our Lady of Lourdes Hospital, County Dublin, and open-air hospitals of 50 beds each at Cork and Galway; and also a special tuberculosis hospital in Dublin. There is need for further special provision for dealing with cancer, but the commission is not yet in a position to make a recommendation.

PROPOSED GRANT FOR MEDICAL RESEARCH

The commission advises that a provisional grant of £10,000 a year should be given to a Medical Research Council, at present being constituted, for the purpose of medical research. The need for developing the social service side of hospital work is strongly stressed, and attention is drawn to the need for almoners' departments in nearly all the Dublin hospitals.

The commission makes a clear statement of the present financial position of the Hospitals Trust Fund and of the cost of carrying out the recommendations now put forward and meeting commitments already entered into. Considering estimates for proposed expenditure and endowment a sum of £7,900,000 will be required to enable the recommendations in regard to voluntary hospitals to be realised. Of this £3,383,853 is at present available. Recent sweepstakes have shown that the share of the voluntary hospitals from each sweepstake averages some £363,000. It is impossible to prophesy whether this return will be maintained or not, but even if it should be, it is clear that it will be some four years before the necessary fund is accumulated. The commission, therefore, believes that caution should be exercised in regard to beginning building schemes which would require a large capital for their completion until it is reasonably sure that sufficient funds will be available. With care, however, an advance might be steadily made without discrimination against any particular hospital or undertaking.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE CORPUS LUTEUM AND PREGNANCY

Dr. J. M. Robson spoke to the Edinburgh Pathological Club last week on his investigations into the activity of the corpus luteum in pregnancy. Among animals, he said, three types can be recognised: (1) those in which ovulation occurs only after mating; (2) those in which ovulation occurs without mating but in which a physiologically active corpus luteum is not formed unless mating takes place; and (3) those in which ovulation and the formation of an active corpus luteum occur spontaneously. In some species (e.g., man) the duration of activity of the corpus luteum of pseudopregnancy is much shorter than that of pregnancy, whereas in others (e.g., dog) the periods are of roughly equal length. In some animals (e.g., the mare) the corpus luteum degenerates in the early stages of pregnancy, and this raises the question how far it is necessary that luteal secretion should continue until term. The available data show that in some species the corpus luteum is essential during almost the whole of pregnancy, but in others (man, horse, cat, and guinea-pig) its removal does not necessarily lead to abortion. The luteal hormone in Dr. Robson's opinion is probably secreted by the placenta as well as the corpus luteum, and the importance of the latter in different species during pregnancy may vary inversely with the capacity of the placenta to produce progestin. During pregnancy this hormone is essential for the preparation of the endometrium after fertilisation, for implantation itself, and probably for the subsequent nutrition of the developing embryo and placenta. It also inhibits the reaction of the uterine muscle to oxytocin and controls the spontaneous rhythmic activity of the uterus—in these respects antagonising the action of œstrin. When the pituitary is essential to the maintenance of pregnancy, its function consists in maintaining the luteal secretion, and pregnancy can actually be maintained in the hypophysectomised rabbit by the administration of the pure hormone progesterone. Experiments now in progress, said Dr. Robson, further show that the structure and secretory activity of the corpus luteum in hypophysectomised rabbits can be maintained by injection of gonadotropic hormones. It is possible, he believes, that in species in which abortion does not follow removal of the pituitary, the secretion of progestin by the corpus luteum and/or placenta may be under the control of gonadotropic hormones produced by the uterine contents.

MENTAL HOSPITALS AND MENTAL HEALTH

In presenting the 123rd annual report of the Royal Edinburgh Hospital for Mental and Nervous Disorders last week Prof. D. K. Henderson said he regarded institutional psychiatry as perhaps the smallest part of the psychiatrist's task. He has a much bigger sphere which involves the prevention rather than the cure of those who may be nervously or mentally ill. The importance of this principle is well recognised by the managers of the hospital whose many organisations show that they are attempting to establish a mental health service in direct relation to the community. The clinics at the Royal Infirmary, at Jordanburn Hospital, and at the University Clinic have formed a chain of medical service which offers help and treatment to all ages and for all conditions of the nervous and mental

health. The number of patients treated shows a steady increase and people are no longer unwilling to consult a psychiatrist. The clinics are of great value in allowing medical students to become familiar with every phase of nervous and mental illness. The student is taught to learn to appreciate how emotional forces can control and modify bodily functions and how readjustment can be effected. The importance of this is emphasised by the fact that a recent survey of a group of insured patients under the National Health Insurance Act showed that a third were incapacitated as a result of nervous illness of some kind. Prof. Henderson said he looked forward hopefully to the time when a department for the treatment of early forms of nervous and mental diseases would be incorporated in every progressive general hospital.

At Glasgow, in the annual report of the Royal Mental Hospital, Dr. Angus MacNiven points out that nearly 40 per cent. of the total admissions show a depressive reaction. He deplores the lack of understanding among the public of mental disorders and mental hospitals, which he describes as a serious obstacle to progress. An encouraging feature, however, is that more than half of those admitted to the hospital came as voluntary patients, using the hospital for the treatment of their mental illness as they would a general hospital for the treatment of a physical complaint. A mental hospital is not a place of discipline, but should be regarded more as a refuge to the patient in time of trial. He stressed the importance of providing facilities for the treatment of functional nervous disorders. The Lansdowne Clinic provided an initial step in this direction, but many cases required to be removed from their home environment and there is an urgent need for the provision of a special hospital or a special department in one of the general hospitals for the treatment of functional nervous disorders.

THE TRAINING OF NURSES IN SCOTLAND

The report of the Scottish Departmental Committee on the Training of Nurses contains some important suggestions for the future development of the nursing profession in Scotland. After a brief summary of the functions of the General Nursing Council for Scotland, the committee review the essential requirements for a fully trained nurse, among which requirements they place experiences in the wards of a hospital for infectious diseases. They discuss the various interests involved—the nurses themselves, the public, the hospital, the doctor, and the local health authorities—showing that no scheme for the training and provision of nurses can be regarded as satisfactory which does not give due weight to the just requirements of each. They point out defects in the present system and make pertinent proposals for remedying them. The most important of the 15 recommendations summarised at the end of the report is that for the establishment of a "Central Registry" to contain the names of nurses who are "fully trained," that is, trained for five years, four of them being spent in a medical and surgical hospital and in a fever hospital, followed by two courses of six months each out of a selection offered, such as sick children, tuberculosis, mental, orthopædics, chronic sick. Nurses who are entitled to have their names on two parts of the register, one being the general part, would also, under the scheme, be eligible for inclusion in the "Central Register." Other recommendations include provision for the examinations in anatomy and physiology, hygiene, and dietetics of the Preliminary State Examination, to be taken as a normal procedure before trainees enter hospital; grants to hospitals providing facilities for the training of nurses for the "Central Register" and also, in lesser amount, to hospitals training in the present system; the establishment of a supplementary part of the register for tuberculosis nurses; and the revision of arrangements for application between hospitals in order to secure a greater degree of elasticity.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE NEW FRENCH ACADEMY OF SURGERY

THERE is nothing in France exactly equivalent to the F.R.C.S. Eng. with its searching examinations and enviable prestige. There is no special surgical diploma or *brevet de chirurgien*. A certain cachet attaches to membership of the *Syndicat des Chirurgiens*, or to one or other of the Parisian or provincial surgical societies, or the surgeon may secure election to the Academy of Medicine or the Academy of Sciences. But now the old *Académie de Chirurgie* has been resuscitated at the Sorbonne in the presence of Mr. Lebrun, President of the Republic, and many other notables. Prof. Gosset, who as president of the executive committee has taken a leading part in this revival, traced in his speech the history of the Academy from its birth in the reign of Louis XV. Dissolved during the French Revolution it has carried on since as little more than a surgical society, its members not enjoying the title of academician. It has long been felt as a slur on surgeons that the Academy of Medicine should monopolise academic honours in the profession; out of a total membership of 120, only 16 seats are reserved for surgeons, though it should be noted that the present occupant of the presidential chair is the well-known surgeon, Prof. Hartmann. It would have been a delicate task to reorganise the Academy of Medicine in such a way as to satisfy the legitimate claims of the surgeons, and Prof. Gosset is to be congratulated on his solution of the problem.

NEW IDENTITY CARDS

Steps have been taken to facilitate travel in France by the issue of a special identity card to be called the "tourist card," and to be valid for six months. It will be issued gratis by French consulates, and will help to do away with some of the formality which has hitherto embarrassed the foreigner wishing to pay something more than a flying visit. The period of grace, during which identity cards were superfluous, has till now lasted only two months and a week. After this interval, visitors had to apply to the préfet for a non-worker's card, for which there was something to pay. Under the new regulations the foreigner shows his passport, signs a declaration to the effect that he will not work in France, and that he has sufficient funds to support him during his stay. His tourist card he must give up on leaving France within six months; if he stays more than that he must apply and pay for a non-worker's card. Between now and the end of this year tourists who have not received a tourist card before entering France must apply for it within 15 days of entering French territory at the local prefecture of police.

PARIS TRAFFIC

In 1935 there were 237 traffic deaths in Paris itself and 226 in its suburbs. This total of 463

compares favourably with the corresponding figure (498) for the previous year. The victims per cent. were pedestrians 56, cyclists 20, employers of various other vehicles 23. Responsibility for the accidents was divided fairly equally between the killers and the killed, 52 against 46 per cent.; in only 2 per cent. was there uncertainty which of the parties was to blame. The danger was greatest late in the afternoon, as many as 141 of all the fatal accidents occurring between 5 and 8 P.M. There were only 30 fatal accidents between midnight and 6 A.M. In 19 per cent. the accidents were traced to drivers who were "insufficient masters of their speed."

CHARLES NICOLLE

The death of Charles Richet, man of science and man of letters, has now been followed, after only a few weeks, at Tunis, by that of another Frenchman distinguished in the world of letters as well as in that of science. Charles Nicolle was gifted with a restlessly imaginative mind, and there was nothing he hated more than the humdrum orthodoxy of most so-called seats of learning. It was, therefore, perhaps well for him that he was able to spend most of his life after 1903 in Tunis where, far from faculties and universities and learned societies, he was free to scoff at them gently and to go his own way, in science as well as in letters. He was never attached to the Pasteur Institute of Paris, and the rumour that he would succeed Roux at this seat of learning proved to be ill-founded. As he remarked whimsically a few years ago, he had too much imagination and independence ever to become a conventional man of science.

CORRESPONDENCE

INTRANASAL SUBMUCOUS INJECTIONS OF CALCIUM

To the Editor of THE LANCET

SIR,—During experiments on the local effect of subcutaneous injection of salt solutions I observed [1] that repeated injection led to thickening of the subcutaneous tissue together with desquamation of the epidermis. The thickening is probably due to an increase of fibrous tissue (histological examinations have not yet been made), and I thought that, if the same effect could be produced by submucous injections, it might be of therapeutic value in cases where excessive serous secretion shows abnormal permeability of the vessels (e.g., vasomotor rhinitis and hay-fever). This idea gained support from a case in which I had made several submucous injections with novocain for the treatment of aural tinnitus [2]; there appeared such thickening of the submucous tissue and disappearance of the cavernous plexus of the inferior concha that further injections were impossible.

Since then, to patients with increased serous nasal secretion, I have given submucous injections of calcium salts into the inferior concha, hoping that the constricting effect of the calcium ions would considerably amplify the non-specific effect of the salt. At first I injected 5–10 c.cm. of 1·5 per cent. calcium chloride solution; later I used stronger solutions, but as calcium chloride in high concentration injures the tissues, I employed 10 or 20 per cent. Calcium Sandoz (gluconate) solution, which was always well tolerated. The injection is made with a straight needle, at least 5 cm. long, into the anterior part of the inferior concha. Very little pain is felt, and anæsthesia is therefore unnecessary. The needle is pushed in for 1·0–1·5 cm., parallel with the concha, and 5 c.cm. is injected, taking about thirty seconds. Only a slight swelling of the concha ensues, since the injection is mostly intravenous; indeed, this submucous route may be used instead of the ordinary intravenous one when the latter presents difficulty. During the injection there is a feeling of heat in the whole body, but no other side-effects and no pain, either at the time or later. When the needle has been pulled out, an adrenaline tampon is placed in the nose and pressed against the wound; after some minutes this can be removed. I repeat the injection on the third day and again on four or five occasions. Usually I do not inject both sides on the same day. In most cases the first injection is followed by reaction with increased secretion, but after the later injections this was not observed. In the patients thus treated the secretion has diminished considerably, and in some cases I have a very good therapeutic result with complete disappearance of unpleasant hypersecretion. In those with allergic rhinitis (principally rhinitis æstivalis) the local application of calcium is active not only in its constricting effect, but probably also because, at high local concentrations of calcium, the antigen-antibody reaction passes off without irritation of cells—that is to say, without hypersecretion. This has lately been shown by P. Kallós and L. Kallós-Deffner [3] in my laboratory.

A detailed report will be published later. Here I want only to show this new possibility of effective therapy.—I am, Sir, yours faithfully,

ROBERT BÁRÁNY.

Ear, Nose, and Throat Clinic, University of Upsala, Sweden, Feb. 29th.

[1] Deut. med. Woch., 1932, lxviii., 1560.
[2] Bárány, R.: Acta oto-laryng., 1935, xxiii., 201.
[3] Klin. Woch., 1935, xiv., 1247. For further information, cf. Wojatschek, W., Undrits, V. F., and Drennowa, K. A.: Zeits. f. Hals-, Nasen,- u. Ohren., 1933, xxxiii., 191; and Drennowa, K. A.: Arch. f. Ohren-, Nasen-, u. Kehlkopfh., 1930, cxxx., 235.

"A DOUBTFUL CASE OF TYPHUS FEVER"

To the Editor of THE LANCET

SIR,—It seems to me that the best comment on the epithet "doubtful" as applied to the case of typhus fever reported on p. 864 of your issue of Oct. 12th last is to be found in the following extracts taken from the article on typhus fever by Drs. Brill and Baehr in vol. i. of Nelson's "Loose-Leaf Living Medicine":—

(P. 200): "The difficulty in diagnosis is increased when a sporadic case of the endemic variety is encountered However if one bears in mind the important clinical features of the disease . . . mistakes in diagnosis will rarely be made. If an incorrect diagnosis is made, it may easily be corrected when the critical fall in temperature occurs, as the crisis is one of the most important differential features of the disease."

"Weil-Felix reaction . . . A negative test cannot be accepted as evidence that the disease is not typhus fever."

(P. 201): "The authors' experience is that in cases of the endemic type the serum seldom gives a W.-F. reaction in dilutions sufficiently high to be of diagnostic value."

". . . The Widal agglutination test with typhoid bacilli was found to be of little differential value. Typhus patients who had previously had typhoid fever . . . often developed a positive Widal reaction during the second week of their disease."

To my mind the case reported is a typical instance of the sporadic endemic typhus, which is a severe

but seldom fatal illness. As Dr. Brill says in the article above quoted (p. 201) referring to the tradition in text-books which inclines the student to believe that there is any difficulty in separating the two diseases (typhus and enteric): "the two diseases have nothing in common in pathology, etiology or symptomatology."

Incidentally, were the two laboratories to which the blood-serum was sent stocked with the varieties of *Bacillus proteus* isolated by the Federated Malay States Institute for Medical Research (see their Bulletin No. 1 of 1930)? It is difficult to say what value can be placed on their reports "Weil-Felix reaction, negative" on a patient who brought the disease from the Straits, if they do not report that the serum was tested against strains of *B. proteus* appropriate to the case in question. If the Port of London health authority reports typhus only when confirmatory evidence is supplied by a laboratory we should hear more about this, and in a disease like typhus it is no use hedging and saying that "bacteriologically the case was considered to be typhoid"!

I am, Sir, yours faithfully,

Hankow, Jan. 27th A. H. SKINNER.

THE TREATMENT OF VAGINAL DISCHARGE

To the Editor of THE LANCET

SIR,—I read Mr. Gordon Luker's letter in your last issue with great interest, inasmuch as his experiences differ so widely from my own. After eight years' work in a large clinic, I have come to the conclusion that the majority of non-venereal discharges of which women *complain* is due either to a staphylococcal or, more frequently, to a trichomonas infection of the vagina. In a small series of 30 cases which I investigated some time ago, I found the trichomonas—identified by the dark-ground method—in 14, or nearly 50 per cent. Its presence was in 9 cases diagnosed before microscopy by the typical frothy discharge. This afternoon I examined the first 6 cases that came in, and found trichomonas in 2 of them. Advertisement or no, this form of infection has yielded more rapidly to Devegan than to any previous form of treatment that I have tried, and while not for an instant suggesting the application of the remedy to vaginal discharges in general, I have found it very useful for what, in my experience, is a common infection.

I am in complete agreement with Mr. Luker on the necessity for a thorough examination of the patient and the discharge itself, but I must differ from him in his opinion of the relative frequency of a trichomonas infection, and the efficacy of devegan in its treatment. I am, Sir, yours faithfully,

Harley-street, W., March 2nd. KEITH DUFF.

"NEAR" X RAY THERAPY

To the Editor of THE LANCET

SIR,—Consideration of the possibilities of Chaoul's new "near" X ray therapy method (THE LANCET, Feb. 29th, p. 482) suggests that these are not limited to the special low-voltage short-focus tube, but could be extended to a much wider use with any fully shock-proof X ray therapy tube. Indeed, many of Chaoul's best results have been attained with a kilovoltage of 180, with 0·5 mm. Cu. filter at 8 cm. distance, or with 100 kV., 0·5 mm. Cu., 11 cm. distance (*see* Tables C and B in *Strahlentherapie* 1933, xlviii., 31 (21 cases)). Tests with a 200 kV. shock-proof tube have shown that it gives a radiation of 50 r/min. at 100 kV. and 30 cm. distance, 0·2 mm. Cu. equivalent filter. Approximately at 15 cm. the radiation is 200 r/min., and at 7·5 cm. it is 800 r/min. Treatment at 6 cm. seems possible with this tube. I doubt if such extremely high intensities as 800 r/min. or more have ever been applied to patients; they would correspond to that from one curie in a bead-sized light applicator to rodent ulcers of minute size by Kelly and Burnham for one minute at the end of a long rod.

After tests of the tube's emission at from 1 to 6 M.A. from 60 to 100 kV. (0·2 mm. Cu. filter) and from 1 to 4 M.A. from 100 to 200 kV. (with heavier filters) I have treated several patients with ulcerated breasts (primary or recurrent) and a supraclavicular metastasis from a parotid tumour. The factors used were 12 and 15 cm. distance, 70 or 80 kV., 4 M.A., and 0.2 mm. Cu. filter; 1½ and 2 minutes exposure. Tests with surgical specula for mouth, tonsil, and cervical applications have also been made with ionisation and pastille methods. Lead or lead-rubber to localise the fields has appeared adequate; special applicators could be put on the market for various sizes and distances.

The daily treatments of from one to four minutes contrast agreeably with the opposite pole of method, the protracted-fractional of Coutard. The latter appears to act "selectively," powerfully affecting abnormal and sparing normal tissues (as radium distance applications do) and is thus most valuable for deep-lying tumours in vital areas; whereas the near method appears to act more "cytocaustically"—as near or contact radium applications (gamma or beta) act—thus being more suitable for quite superficial lesions, specially if already ulcerated. These two extremes of method have greatly enlarged the field of X ray therapy. The near method, however, should be explored to the full possibilities of shock-proof tubes and not be limited to the use of the small aperture 60 kV. tube specially designed for cavitary applications.—I am, Sir, yours faithfully,

J. H. DOUGLAS WEBSTER.

Harley-street, W., Feb. 29th.

ALLEGED NEGLIGENCE IN HYPODERMIC INJECTION

To the Editor of THE LANCET

SIR,—The article in last week's issue of THE LANCET (Medicine and the Law, p. 500) reminds me of an unpleasant experience I suffered about 25 years ago. I have before now related the circumstance to my students as a warning.

About five years prior to the incident leading to the allegation I had been consulted by a practitioner of medicine who had contracted syphilis, and I had treated him over a long period. One evening a telephone message summoned me to his house some four miles distant. He was suffering intense pain. Obviously morphine was necessary, but upon my suggestion that I should go home and fetch a syringe and drug he replied, "It will take you half an hour" (20 mile limit then). "I can't stand this pain. Here is my syringe and morphine."

Upon examination of the syringe I noticed that it was fitted with a leather washer and remarked that it could not be boiled. He persuaded me to use it; after rinsing it many times in carbolic acid solution, morphine was dissolved in boiled water and injected into the arm. Three or four days later I heard that the doctor was in a home, and on going to see him learnt that he had cellulitis of the arm which needed incisions. I expressed regret. The following day a letter informed me that he was taking proceedings against me, claiming damages for negligence. On

approaching the defence society to which I subscribed I learnt that the plaintiff had already communicated with the society, and the secretary doubted whether in the circumstances the committee of the society would arrange for my defence, because I should lose. In answer to the question "Why," he said that in cross-examination the counsel would ask me whether I had found fault with the syringe, and upon my admitting that I had he would say, then you had no right to use it. A mutual friend approached the practitioner. Years later it came to my ears that he had used the argument that the counsel for the defence would have asserted that in a normal man cellulitis would have not developed, and that the plaintiff's resistance had been reduced by syphilis. Anyway the charge was withdrawn; a few days later a generous patient made me a present which I had the pleasure of forwarding to the unfortunate practitioner, and this more than covered his expenses.

I am, Sir, yours faithfully,

O. L.

March 2nd.

STAMMERING

To the Editor of THE LANCET

SIR,—I was very interested in the annotation on the subject of stammering in your issue of Jan. 25th (p. 208) but I was puzzled by the following sentence: "For this reason some authorities have dispensed with any specific speech training and have concentrated . . . on relaxation." Since we are not bivocal but use the larynx for speech and song, surely speech training should proceed on the lines of training the voice for song. All singers will agree that one of the most important factors in voice training is to teach the pupil to relax as far as possible all muscles in the throat and neck which do not assist in the production of vocal tone; in other words, to overcome hypertonicity which must be overcome not only by a stammerer but by every speaker or singer who aims at getting the best results from his larynx.

Miss Kate Emil-Behnke in her interesting letter of Feb. 22nd seems to contradict herself when she says, "it will yield to psychic handling combined with 'relaxing' and quiet breathing exercises," and "the serious error of adopting *elocutionary* treatment." If elocution means, as it should, speech training and voice training, it must include some study of deep breathing (to learn breath control) and "relaxing" as described above. If Miss Behnke means the type of elocution which merely consists in the overstressing of the consonants I am in agreement with her, because nearly all stammerers already overstress the consonants at the expense of the vowels, and thus talk in the jerky, staccato manner which, in its most exaggerated form, is a typical stammer. When singing the vowels must predominate, and they should do so to some extent in good speech. It is this predominance of the vowels which enables the stammerer to sing without difficulty. If the stammerer will cultivate a slight predominance of vowels over consonants he will learn to speak smoothly and will overcome hypertonicity. This should be the aim of everyone who wishes to speak musically and audibly; it is not a mannerism to cure a stammer but the method of getting the best results with the least effort.

Although some knowledge of deep breathing and breath control is needed for perfect speech it should be clearly understood that taking a deep breath before speaking will increase the difficulties of a stammerer and of any other speaker. "Little and often" is a good rule. One of the greatest singers of all time said, "Never take more breath than can be easily controlled."

The unusual type of stammerer who stammers on the vowels as well as "sticking" on the consonants presents a difficult problem to the speech therapist, but space will not allow a detailed explanation here.

The variability of the incidence of a stammer proves that it is very largely due to a neuropathic condition, but I cannot think of anything more calculated to overcome this condition than learning the fundamental principles of perfect speech, while the success which follows such study will obviously allay anxiety.

I am, Sir, yours faithfully,

H. ST. JOHN RUMSEY, M.A.,
Instructor for Speech Defects at Guy's Hospital.

Feb. 22nd.

A SECONDARY REACTION AFTER ANTI-CHOLERA INOCULATION

To the Editor of THE LANCET

SIR,—During the last cholera epidemic in the Bassi district in Patiala State mass anticholera prophylactic inoculation was done. This produced a general and a local reaction which lasted for two or three days after the inoculations. To my utter surprise, however, about 8–10 per cent. of the persons inoculated got another general and local reaction on the twelfth, thirteenth, or fourteenth day after the inoculation, in the usual form of a pyrexia (varying from 100–102° F.) and local redness at the site of the injection, along with pain and tenderness. But this secondary reaction, as I may call it, was milder than the primary one, and no other sign or symptoms were observed. It lasted for about 28–36 hours only, and many of the sturdy villagers took no account of it. Those who came to us for advice were treated on general lines and symptomatically.

The only explanation that I could think of at that time was that the condition was caused by abscess formation due to negligence in our asepsis. But among 4000 cases of inoculation done by me in that part of the district, there was only one abscess (on the sixth day). We had taken every possible aseptic precaution throughout and the vaccine, which was supplied by the Central Research Institute, Kasauli, was used within two or three days of its receipt. I consulted my colleagues who too were working in the other cholera-stricken areas of the State and all of them had also observed the same phenomenon. We could find no published information, however, concerning the cause or significance of a secondary reaction after prophylactic anti-cholera inoculation, and I should be glad therefore if any of your readers could tell me whether they have seen such a thing or can throw light on its origin.

I am, Sir, yours faithfully,

M. TEWARI,
Hon. Clinical Assistant, Rajindra Hospital, Patiala (State), India.

Jan. 15th.

AN ADDRESS IN HARLEY STREET

To the Editor of THE LANCET

SIR,—A distinguished hospital surgeon, not living in Harley Street, told me the following story; it is very apropos to Mr. F. C. Goodall's letter in your columns last week. The surgeon was asked to see in consultation a patient living in the country, when it was his duty to tell the husband "there is nothing to be done." Leaving the house with the family practitioner, the latter was called back by the husband, and on rejoining the consultant he exclaimed,

"that man said, 'now let's have a Harley Street man!'" Mr. Goodall is right. The public should learn "Harley Street is not a degree but an address"; believe me, they do not realise it, and the owner of an address in Harley Street knows its commercial value.

I am, Sir, yours faithfully,

March 3rd. W. B. C.

SHORT-WAVE THERAPY

To the Editor of THE LANCET

SIR,—The statement in a leading article in THE LANCET of Feb. 22nd (p. 436) that "Short-wave therapy has come to mean treatment by electromagnetic oscillations, &c.," requires correction. Actually most treatments are carried out by the use of the high-frequency electric field. Electromagnetic oscillations are not as a rule used for wave-lengths shorter than 20 metres. A more serious error, and one which is often repeated, is that "for each substance there is a definite wave-length with which, for a given field strength, the heat produced is maximal." It should have been stated that for a given wave-length there is a definite conductivity for which heating is maximal—a very different statement. This effect shows itself even in wave-lengths as long as 200 metres. Further, the writer of the article states that the kidney of an animal can be necrosed without damaging the skin. I have carried out experiments on large numbers of animals, using 4·5 m. and 3·4 m., and have never noticed this effect unaccompanied by inflammatory changes in the skin and superficial tissues. Lastly I would mention the fact that as far as I can find in the literature the claim for "specific" effects on bacteria has never been independently confirmed. A paper was published by Sir Leonard Hill and myself in THE LANCET of Feb. 8th, 1936 (p. 311), which showed that we could find no evidence for any "specific" effect of the high-frequency field on some physiological preparations.

I am, Sir, yours faithfully,

H. J. TAYLOR.

St. John Clinic and Institute of Physical Medicine, Ranelagh-road, London, S.W., March 2nd.

*** We had hardly thought it open to doubt that when a number of substances of different conductivities and about the same dielectric constant are placed in the condenser field one substance is likely to be heated more rapidly, at any given frequency, than the others—that one, namely, of which the conductivity most nearly satisfies the simple relationship $x = \frac{1}{2}\nu\epsilon$ (x = conductivity, ν = frequency, ϵ = dielectric constant). It was made clear in our comments that the alleged lethal effects on bacteria are frequently disputed; we are interested to know that Dr. Taylor has himself never observed necrosis of the kidney without some damage to the superficial tissues.—ED. L.

PANEL AND CONTRACT PRACTICE

Insulin for Seamen

Two doctors have recently been called to account for prescribing insulin, sufficient to cover the period of a transatlantic voyage, for seamen whose names were included on their lists. Under Section 62 of the N.H.I. Act, 1924, a master or seaman is not entitled to medical benefit for any period during which the owner of the ship is under the Merchant Shipping Act, 1894 (as amended by any subsequent enactment, or otherwise), liable to defray the expense of the necessary advice, attendance, and medicine. Section 34 (1) of the 1906 Act, as amended in 1923, provides that if the master or seaman suffers from any illness (not being an illness due to his own wilful act or default or to his own behaviour) the expenses shall be defrayed by the owner of the ship, without deduction from his wages. It seems that the men in question were entitled to treatment during the voyage from the ship's surgeon (in each case the ship was a passenger liner) and not entitled to medical benefit. Normally the cost of any prescription issued by a doctor for a preparation which does not form part of medical benefit would be recovered from the practitioner by deduction from his remuneration and the chemists' fund appropriately reimbursed. In one case the man remained on the ship for only half the anticipated period and was entitled to medical benefit for the remainder. The insurance committee took the view that the doctors had acted in good faith, and was disinclined to debit their accounts with the cost of the insulin. A warning letter is to be issued and, subject to the consent of the Minister of Health, the cost of the prescriptions (about £3 17*s.* 6*d.*) in so far as it is not chargeable to the chemists' fund will be met from the general purposes fund. This seems to be a sensible way out of the difficulty, but it may be wondered what arrangements would have been made for the supply of insulin to these diabetic mariners if they had joined a "dirty British coaster with a salt-caked smoke-stack." Perhaps, if they had divulged their condition, they would not have been signed on at all.

"Special Skill and Experience"

The London insurance committee has just had a report on specialist services rendered during 1935 to insured persons by insurance doctors in the county. In each case the local medical and the insurance committees agreed that the service rendered involved the application of special skill and experience of a degree or kind which general practitioners as a class could not reasonably be expected to possess, and that the practitioner concerned was possessed of the necessary skill and experience to enable him adequately to carry out such service. Some 2075 doctors are included in the committee's medical list, and of these 6 charged fees for ophthalmic and 12 for other services, the complete list being as follows:—

OPHTHALMIC SERVICES	Cases.
Retinoscopy and ophthalmoscopic examination	11
Retinoscopy and prescribing glasses	7
Refraction—ophthalmoscopic examination	34
Refraction under mydriatic—ophthalmoscopic examination	22
Refraction and prescribing of glasses	1
OTHER SERVICES	
Ultra-violet rays for: eczema, 2; furunculosis, 2; boils, 1; respiratory catarrh, 1; neurasthenia, 4; sweats and frequent colds—general debility, 2; acne of face—debility, 2; arthritis of knees, 1; alopecia, 1; melancholia, 1. Total	17
Infra-red treatment for acute myositis	3
Course of pelvic diathermy	1
,, ,, and cervical diathermy	1
Diathermic coagulation with local anæsthesia	1
Appendicectomy	5
Psychotherapy for anxiety neurosis	3
Tonsillectomy—dissection of tonsils	3
Removal of large Meibomian cyst	1
Removal of toe for long standing deformity	1
Dilatation and curettage for dysmenorrhœa	1
X ray diagnosis of septic focus in tarsal bone	1
Radiant heat and massage for intercostal fibrositis	1
	114

Surgery Inspection

A practitioner who recently applied for inclusion in the London medical list intimated that he desired to carry on an insurance medical practice at a place other than where he resided, the distance between the addresses being about a quarter of a mile. There was no caretaker at the surgery, no deputy had been appointed to act in case of emergency, and there was no telephone either at the residence or at the surgery. The doctor said he proposed to exhibit at the surgery a notice indicating his private address. The insurance committee, not being satisfied that the proposed arrangements were adequate, asked an ex-chairman of the committee, along with the secretary of the local medical and panel committee, to visit the surgery and report. On the morning on which the visit was due to be made a letter was received from the doctor to the effect that his surgery premises were shortly to be demolished, that he was hoping to obtain other premises in the course of a few weeks, and suggesting that in these circumstances the visit was unnecessary. It was then too late to cancel the visit and the report showed that the waiting- and consulting-room consisted of a small shop with a screen running partially down the centre. The screen did not reach from end to end of the room nor did it reach the ceiling, there being at least three feet between the end of the screen and the further wall and a similar gap between the top of the screen and the ceiling, so that a waiting patient could hear all that occurred in the consulting-room. The committee's representatives informed the doctor that the accommodation provided was unsuitable for an insurance medical practice; his application for the inclusion of his name in the medical list remains in abeyance pending the submission of particulars about alternative accommodation. Some other premises have recently been found unsuitable for their purpose. Up to the present time visits have been paid to surgeries only when practitioners have applied for consent to the employment of an assistant or where some special cause has arisen. The insurance committee has now referred it to the proper subcommittees to consider and report on the desirability of satisfying the committee in every instance with the surgery accommodation to be provided by an insurance practitioner before he undertakes insurance work. Clause 9 (4) of the Terms of Service lays on the insurance committee the onus of seeing that the accommodation provided befits the conditions of practice.

OBITUARY

JAMES BRUNTON BLAIKIE, M.B. Edin.

Dr. James Blaikie, who died on Feb. 26th, received his medical education at the University of Edinburgh where he was a successful student and president of the Royal Medical Society. He graduated as M.B., C.M. in 1896 and proceeded to the M.D. degree in 1903, and acted as resident physician at the Royal Infirmary. In London he held clinical appointments at the Hospital for Sick Children, the Victoria Hospital for Children, and the Hospital for Skin Diseases, Blackfriars. He was appointed physician to the Hospital for Consumption in Margaret-street, and was assiduous in attendance there, his professional work being of a practical order. He made occasional contributions to the *Edinburgh Medical Journal* and to these columns, but his time was absorbed in an extensive practice. He was held in high esteem by his colleagues and a large section of the public, as was evidenced by the attendance at the service held in his memory. He had the gift of making friends of his patients, and in particular earned the gratitude of the mothers whose children he had under his care. Such holidays as he spared himself were spent in fishing, a sport to which he was devoted and about which he wrote pleasantly.

SEPTIMUS TRISTRAM PRUEN, M.D. Durh.

THE death occurred on Feb. 19th of Dr. Septimus Pruen, for many years a prominent practitioner in Cheltenham. He was born at Clifton, Bristol, in 1859, the son of Dr. William Ashmead Pruen, received his education at Bedford School, proceeding for medical training to St. Bartholomew's Hospital and the University of Durham. He graduated as M.B. Durh. in 1883 with honours and was a medallist for his public health work; in the following year he took the diploma of M.R.C.S. Eng. He was appointed assistant demonstrator in anatomy and physiology at Durham and later acted as house surgeon to the Cheltenham Hospital. This post he held for two years and in 1886 proceeded to Central Africa as a medical officer of the Church Missionary Society. He remained in Africa for three years and recorded his experiences in a short work "Arab and the African." On his return to England he commenced practice in Cheltenham and became medical officer at the Cheltenham Medical Workhouse and Provident Dispensary, and surgeon to the Hospital for Sick Children. About this time the open-air treatment of phthisis was being introduced into this country by Otto Walther's pupils and Dr. Pruen collaborated with his partner, Dr. J. C. Braine-Hartnell in founding the Cotswold Sanatorium on the hill 600 feet above the town. The venture was popular and successful, and for many years there was a considerable publication of useful papers dealing with various aspects of hygienic-dietetic treatment. Dr. Pruen was local medical officer of the Charity Organisation Society and was an energetic member of the British Medical Association of which he was a member for 44 years, being local secretary at the Cheltenham meeting in 1901 and later president of the Gloucestershire branch of the Association.

VINCENT THOMAS BORTHWICK YULE, M.B., Ch.B., D.P.H. Aberd.

THE death occurred on Feb. 17th of Dr. Vincent Yule, the M.O.H. for the borough of Peterhead. He was born in Peterhead and had a successful career at the University of Aberdeen, where he graduated as M.A. and took the medical degrees of M.B., Ch.B. in 1917 and D.P.H. in 1920. During the war he received a commission as Captain R.A.M.C., and saw service in East Africa. At the conclusion of hostilities he was appointed R.M.O. at the Aberdeen City Hospital, after which he accepted an appointment in Mexico as medical officer to one of the oilfields. On his return he was for three years in practice at Maud, Aberdeenshire, when he entered on practice at Peterhead and in 1925 was appointed M.O.H. for the borough, a position which he held at the time of his death. This occurred at the age of 45 after a short life of full and varied experience.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Milk and Nutrition Problem

ON March 2nd in the House of Commons Mr. RAMSBOTHAM, Parliamentary Secretary to the Ministry of Agriculture, moved the third reading of the Milk (Extension of Temporary Provisions) Bill.

Mr. T. JOHNSTON, in moving the rejection of the Bill, said that since the previous discussions on the measure in the House of Commons there had been a remarkable correspondence in the *Times* on the subject of insufficient nutrition among the population of this country. Nobody in that correspondence denied that at least 10 per cent. of the population was living below the British Medical Association's minimum standard. Sir John Orr had said that almost one-half of the population in our industrial areas were not getting enough to eat, and he mentioned milk as one of the foodstuffs which ought to be better and more widely distributed. The Minister of Agriculture did not deny that a large proportion of the population was under-nourished, and yet the right hon. gentleman was using public money for the destruction of 27 per cent. of liquid milk through its diversion to manufacturing purposes. We were spending at least £111,000,000 a year in the treatment of disease and the policy of organising scarcity in such an essential foodstuff as liquid milk was against the public interest.

Mr. ELLIOT, Minister of Agriculture, in reply, said that the enormous importance of fresh food such as milk in the avoidance of disease was a matter of general agreement in the House. His only point of difference with Mr. Johnston was when the right hon. gentleman said that the Government were organising scarcity. The production and consumption of milk had increased greatly in recent years. Mr. Johnston's motion, if carried, would bring the milk in schools scheme to an end. Steps were outlined in this Bill to extend the supply of milk itself, as well as that of butter and cheese.

Mr. JOHNSTON asked whether raising the price of milk to children's hospitals and to poor-law infirmaries was doing anything to increase consumption.

Mr. ELLIOT called on Mr. Johnston to mention one child in one hospital who had received a pint of milk less because of the steps taken by the Milk Marketing Board.

Mr. JOHNSTON asked whether the Minister of Agriculture was aware that a hospital in Glasgow had to pay £500 a year more for its milk, and that there were threats by the managers of some hospitals that they would be compelled to take a lower grade of milk.

Mr. ELLIOT: I challenged the right hon. gentleman to name one hospital where one child was having one pint of milk less per day and he is totally unable to do so. He merely said that in future in some hospital a lower grade of milk may be used. I do not think he has met the challenge. If the whole assistance being devoted to the butter and cheese industry were devoted to the liquid milk industry it would not mean a reduction of more than a quarter of one farthing a pint in the price of liquid milk, and no one would say that this would increase the consumption of liquid milk to-day. The right hon. gentleman went on to say that the Government had given a breathing space to the industry for which they made no apology, and they had given cheap milk to schools, for which they did not apologise, and this was a Bill to continue those things.

Mr. T. WILLIAMS said that nothing in this Bill was calculated to provide more milk for that section of the community which most needed it.

The motion for rejection was negatived by 242 votes to 110, and the Bill was read the third time.

Voluntary Hospitals (Paying Patients) Bill

In the House of Commons on Thursday, Feb. 27th, the Voluntary Hospitals (Paying Patients) Bill was read a second time.

HOUSE OF COMMONS

WEDNESDAY, FEB. 26TH

Newspaper Wrappers and Food Contamination

Mr. H. G. WILLIAMS asked the Minister of Health if he was aware of the practice among retail butchers and fishmongers of purchasing old newspapers, which might be contaminated and carriers of disease, for the purpose of wrapping up meat or fish sold in retail shops; and whether he would take steps to make this practice illegal, and ensure the use of clean grease-proof paper for these purposes.—Mr. SHAKESPEARE replied: My right hon. friend is aware of this practice, which on general grounds of cleanliness is to be deprecated, but he is advised that there is no definite evidence that the wrapping of meat or fish in newspapers is a factor in the spread of disease, and he would not therefore be justified in taking the steps suggested by my hon. friend.

Medical Services at Junior Instruction Centres

Mr. TEMPLE MORRIS asked the Minister of Labour whether medical inspection and treatment was now available for boys and young men attending instructional centres in the special areas; and, in that case, by whom the cost was provided.—Mr. ERNEST BROWN replied: I assume that my hon. friend is referring to persons in attendance at junior instruction centres and not to adults. Proposals submitted by education authorities for the establishment and conduct of authorised courses of instruction, including junior instruction centres, may include provisions under which any boy or girl may be referred by the superintendent of the course to the school medical officer, with a view to such inspection, and, in England and Wales, such treatment as may be found desirable. I have approved proposals including provisions—of varying extent—for medical services from the following authorities in the special areas: education authorities for the administrative counties of Durham, Northumberland, Glamorgan, Monmouth, Ayrshire, Dunbarton, and from the education authorities for the county boroughs of Gateshead, South Shields, Sunderland, and Merthyr Tydfil. I intend, at an early date, to issue to all authorities conducting authorised courses of instruction a memorandum dealing with the provision of medical services in connexion with junior instruction centres, and it is my hope that this will lead to a marked increase in the number and scope of proposals of this kind.

THURSDAY, FEB. 27TH

Provision of Food at Junior Instruction Centres

Mr. GEORGE HALL asked the Minister of Labour whether he was aware that an examination by the school medical officers revealed that 57 per cent. of the trainees at four junior instruction centres in the county of Glamorgan were suffering from malnutrition; and whether he would take steps to empower the local authorities responsible for these centres to supply meals as well as milk to trainees in attendance.—Mr. ERNEST BROWN replied: Local education authorities have no power to provide ordinary meals in junior instruction centres. Free milk is, however, being provided in the Glamorgan centres, and I am informed that the school medical officer expressed the view that since any food given at the junior instruction centres can only be a casual and temporary addition to the diet of the pupils, the milk available is more useful than any other food which could be suggested in the circumstances. I am, however, making inquiries into the adequacy of the existing arrangements.

Certification of Cases of Silicosis

Mr. LEACH asked the Home Secretary if he would consider introducing further legislation to ensure prompter

and easier certification of cases of silicosis in the mining and quarrying industry, and to ensure that compensation and measures for the recovery of the victims might be made more certain.—Sir JOHN SIMON replied: I would refer the hon. Member to the reply given on the 13th of this month. If the hon. Member will be good enough to send me a statement showing where and how it is suggested that the medical arrangements and the procedure under the Silicosis Schemes could be improved, I shall be happy to consider it.

Mr. LEACH: Does not the right hon. gentleman agree that both the law and the regulations operate very harshly towards these poor fellows?—Sir J. SIMON: It is a very complicated subject, but I have the fullest sympathy with those who want to have the whole situation cleared up and made as simple as possible.

Death Certifications and Vaccination

Mr. BANFIELD asked the Minister of Health how many of the deaths associated with vaccination on certificates of deaths in the years 1933, 1934, and 1935, respectively, were or would be classified by the Registrar-General to vaccinia; and how many deaths under five and over five years of age, respectively, were or would be classified as chicken-pox and erysipelas during the years in question.—Sir KINGSLEY WOOD replied: The following is the statement:—

Year.	Deaths associated with vaccination and classified to vaccinia.	Deaths classified to—			
		Chicken-pox.		Erysipelas.	
		Under 5 years.	Over 5 years.	Under 5 years.	Over 5 years.
1933	3	31	12	296	895
1934	5	36	10	231	1227
1935	4	Not yet available.			

Public Health Legislation

Sir ARNOLD WILSON asked the Minister of Health whether and, if so, when he proposed to introduce a Public Health Amendment Bill which would embody in that general law and make generally applicable powers usually granted by Parliament as a matter of course in local Acts, as recommended by the Select Committee on Private Bills in 1930 for reference to a joint committee of both Houses, in the same way as Consolidation Bills.—Sir KINGSLEY WOOD replied: My hon. friend will be aware that a draft has been published of a Bill to consolidate with amendments part of the general public health law. In preparing this Bill account has been taken of the relevant provisions allowed by Parliament in local legislation. I regret that considerations of parliamentary time have rendered it impracticable fully to implement the recommendation to which my hon. friend refers, but I recognise its importance and hope it may be practicable to take further action in an early session.

Unemployed Persons and Food-supplies

Mr. DAVID ADAMS asked the Minister of Health whether, in view of the fact that the consumption by families of the unemployed of meat, including beef, mutton, bacon, &c., and of eggs, was, like that of milk, only about one-third that of the average of the whole country, he would take the necessary steps, as in the case of milk, to ensure cheaper supplies to unemployed of these essential foodstuffs, and thus raise the low nutritional standards of these citizens.—Sir KINGSLEY WOOD replied: The consumption of the commodities mentioned as well as of other foodstuffs by various classes of the community is a matter which receives the constant attention of my Advisory Committee on Nutrition, but the most effective steps that can be taken to raise nutritional standards are undoubtedly such steps as are being taken by the Government to reduce unemployment and increase purchasing power.

Tuberculosis in Wales

Sir WILLIAM JENKINS asked the Minister of Health what number per thousand of the population of Wales were suffering from tuberculosis; what number under treatment at sanatoria or other suitable institutions; what number of recoveries; and what number of deaths under 12 years of age, under 20 years, under 30 years and over for the years 1924, 1926, 1930, 1934, and 1935 giving the figures separately for each county in Wales.—Sir KINGSLEY WOOD replied: As regards the first three parts of the question, the following are the figures for which the hon. Member asks, according to the returns furnished by the local authorities and the King Edward VII Welsh National Memorial Association to the Welsh Board of Health in respect of the year 1934:—

Tuberculous persons on the registers of medical officers of health at Dec. 31st, 1934, per thousand of the population of Wales	9·64
Under treatment or observation at sanatoria or other suitable residential institutions on Dec. 31st, 1934 ..	1650
Number of recoveries recorded during 1934	1213

As regards the fourth part of the question, figures are not available for the age-groups specified. The available figures of tuberculosis deaths by ages in the 13 Welsh counties are published in the Registrar-General's Statistical Review, Tables, Part I., Medical, Table 20 for the years 1924, 1926, and 1930, and Table 24 for 1934. Figures for 1935 are not yet available.

MONDAY, MARCH 2ND

Expectation of Life of War Pensioners

Mr. MABANE asked the Minister of Pensions if, for the purpose of his estimates, the expectation of life of war pensioners was calculated according to a normal table or on a table which gave to war pensioners an expectation of life shorter than the normal.—Mr. R. S. HUDSON replied: The mortality-rate of disabled pensioners is and will for some years to come be greater than the normal, and in framing the Estimates of the Ministry of Pensions this and all other relevant factors are taken into account.

Convictions for Murder

Mr. DAY asked the Home Secretary the number of persons convicted of murder and sentenced to death for the five years ended to the last convenient date; the number reprieved; the number of sentences quashed on appeal; the number of persons certified as insane and removed to Broadmoor; and the number so convicted that were recommended to mercy by the jury, and with what result.—Sir JOHN SIMON replied: The particulars are as follows:—

Year.	Persons convicted of murder and sentenced to death.	Reprieved.	Sentences quashed on appeal.	Certified insane and removed to Broadmoor.	Recommended to mercy.	
					No.	Result.
1931 ..	18	7	1	1	4	All reprieved.
1932 ..	15	6	0	0	5	.. ..
1933 ..	19	9	0	0	10	8 reprieved. 2 executed.
1934 ..	24	12	2	1	12	9 reprieved. 3 executed.
1935 ..	21	8	2	1	8	6 reprieved. 1 executed. 1 conviction quashed on appeal.
Total for five years 1931–35	97	42	5	3	39	32 reprieved. 6 executed. 1 conviction quashed on appeal.

Imported Chilled Meat and Foot-and-Mouth Disease

Brig.-General CLIFTON BROWN asked the Minister of Agriculture whether, in view of the fact that the virus of foot-and-mouth disease survived in chilled meat and that this disease was distributed by the use of bones imported in chilled meat, the Government was taking any action to prevent the importation of meat which

might carry the virus from any country in which this disease prevailed.—Mr. ELLIOT replied: So far as I am aware, there is no evidence to support my hon. friend's statement that foot and mouth disease is distributed by the use of bones imported in chilled meat, but I recognise that there is some such risk. Regulations governing the exportation of carcases to this country have been in force in the South American meat exporting countries since 1928 and assurances were given as recently as last year by the Governments concerned that these regulations are being properly enforced. In addition, orders are in force in this country directed to preventing the spread of disease through pig food and meat wrappers and other similar material.

Small-pox Deaths

Mr. BROMFIELD asked the Minister of Health, in view of the fact that the published reports of his department did not supply full statistics as to the numbers of vaccinated and unvaccinated cases of, and deaths from, small-pox which occurred in England and Wales during the years 1922 to 1934, he would supply a statement in respect of each of the years in question, showing, so far as possible, the cases and deaths which were recorded in the hospital registers as vaccinated, unvaccinated, and doubtful, respectively.—Sir KINGSLEY WOOD replied: I regret that I have no fuller information in respect of the years 1922 to 1933 than that contained in the annual reports of the Chief Medical Officer of my department. The appended table gives the vaccinal condition of cases of small-pox occurring in England and Wales in the year 1934 in towns of 150,000 population and over.

A. = Successfully vaccinated. B. = Unvaccinated.

Ages.	Vaccinal condition at time of infection.*		Ages.	Vaccinal condition at time of infection.*	
	A.	B.		A.	B.
Under 1 year	..	1	14 years	..	6
1 year	..	Nil.	15 ,,	2	26†
2 years	..	1	20 ,,	..	16
3 ,,	..	7	25 ,,	2	8
4 ,,	..	2	30 ,,	1	4
5 ,,	..	Nil.	35 ,,	2	2
6 ,,	..	4	40 ,,	3	4
7 ,,	..	4	50 ,,	4	..
8 ,,	..	6	60 ,,	5	..
9 ,,	..	10	70 ,,	1	..
10 ,,	..	2	80 and upwards	1	..
11 ,,	..	4			
12 ,,	1	6			
13 ,,	..	6	Totals ..	22	119

* There were no doubtful cases.
† Including one fatal case in a youth of 16 years.

Smokeless Fuel and Atmospheric Purity

Mr. DAVID ADAMS asked the First Commissioner of Works, in view of the recent report upon atmospheric pollution issued by the Department of Industrial and Scientific Research which showed that the general cleanliness of the atmosphere was not improving, if he would give a lead to the country by ordering the use of smokeless fuel in the Government buildings under his department in London.—Mr. ORMSBY-GORE replied: Smokeless fuel is already used in Government offices whenever local circumstances make it possible without an unreasonable increase in cost.

TUESDAY, MARCH 3RD

Mental Deficiency Research

Mrs. TATE asked the Minister of Health how many local authorities had made use of their powers under the Mental Treatment Act, 1930, to provide money for research into mental disorder and deficiency; and how much money they had provided.—Mr. SHAKESPEARE replied: Owing to financial considerations, schemes have not yet been initiated under the specific provisions referred to; but the most recent record of the varied and extensive research work proceeding in public mental hospitals and mental deficiency institutions will be found in Part II. of the Board of Control's Report for 1934.

Army Recruits and Defective Health

The Duchess of ATHOLL asked the Secretary of State for War the proportion of men applying to join the Army in the last three years who were rejected for defective health or physique.—Mr. DUFF COOPER replied: The percentage of men served with notice papers who were rejected for medical or physical reasons during the three years ending Sept. 30th, 1933–35, was 52, 46, and 33 respectively.

School Dental Service

Mr DAY asked the President of the Board of Education the number of children attending public elementary schools in England and Wales in the 12 months ended to the last convenient date who were inspected by school dentists; the number who were found to require treatment; and the number who received treatment under the arrangements made by local education authorities.—Mr. OLIVER STANLEY replied: Complete information is not yet available for the year 1935. The figures for the year ended Dec. 31st, 1934, are as follows:—

Children inspected	3,302,838
Found to require treatment	2,273,508
Treated	1,431,775

FOTHERGILL TESTIMONIAL FUND

THE following is the third list of subscriptions to the testimonial to Dr. E. Rowland Fothergill, received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th.

Amount previously acknowledged, £386 7*s*.

A. M. Daldy (Hove), £1 1*s*.; A. C. Gemmell (Hove), C. G. Schurr (Hove), L. A. Parry (Hove), A. Hall, F. H. Lawson (Hove), R. Ashleigh Glegg (Lewes), J. G. Thwaites (Brighton), G. B. Thwaites (Brighton), E. V. Oulton (Hove), I. Turton (Hove), D. A. Crow (Hove), Lilias M. Jeffries (Hove), Barbara M. Logan (Hove), Florence M. Edmonds (Hove), M. J. Oliver (Hove), A. N. Pollock (Hove), Robert Sanderson (North Lancing), Gladys M. Wauchope (Hove), Conwy L. Morgan (Hastings), F. J. Thorne (Bexhill-on-Sea), P. Lazarus-Barlow (Bexhill-on-Sea), R. Jaques (Worthing), Dr. Martin, Dorothea A. Carew Hunt (Hove), R. C. McQueen (Eastbourne), J. M. Anderson (Hove), J. T. Calvert (Eastbourne), A. G. K. Ledger (Shoreham), M. Ross Taylor (Eastbourne), Eliot Curwen (Hove), A. Burn (Eastbourne), P. S. Eves (Brighton), Duncan D. Macintosh (Worthing), Mark Jackson (Bexhill-on-Sea), and G. Tolcher Eccles (Hove), £60; H. F. Wattsford (Newcastle) and G. R. Fortune (Newcastle), each 10*s*. 6*d*.; R. Boyd (Manchester), £1 1*s*.; Northumberland Local Medical Committee, £26 5*s*.; Derby Local Medical and Panel Committee, £5; Stockport and Leicester Local Medical and Panel Committees, and Sir Robert Bolam (Newcastle), each £5 5*s*.; A. Gregory (Manchester), F. L. Angior (Wigan), T. H. Gardner (London), J. N. Ferguson (York), J. W. King (Derby), E. W. Goodall (London), and F. J. Baildon (Southport), each £1 1*s*.; W. Johnson Smyth (Bournemouth), £3 3*s*.; A. B. Murray (Banff), £5 5*s*.; Jane L. K. Aitken (London), 10*s*. 6*d*.; G. J. Awburn (Mottram, Manchester), John Clay (Newcastle), M. W. Renton (Dartford), and C. E. Douglas (St. Andrews), each £1 1*s*.; Nottinghamshire Panel Committee, £10 10*s*.; A. R. Berrie (London) and D. Clow (Cheltenham), each £1 1*s*.; Huntingdonshire Panel Committee, £2 2*s*.; J. E. Hailstone (Sliindon Common, near Arundel), R. S. Harper (Hove), A. H. Williams (Horsham), W. Broadbent (Hove), H. Herbert (Worthing), E. R. Hunt (Hove), Alice Owen (Horsham), F. H. Allfreys (Southwick), W. G. Thwaites (Brighton), G. Handcock (Hove), T. S. Taylor (Hailsham), W. L. Dickson (Brighton), I. Kinsley (Brighton), East Kent Division B.M.A., F. E. Fellden (Hove), H. J. McCurrick (Hove), John Kerr (Bexhill-on-Sea), and J. F. Atkins (Hove), £55; West Riding of Yorkshire Panel Committee, £10 10*s*.; Bath Division B.M.A., £20; Darlington Panel Committee, £2 2*s*.; Kent Panel Committee, £100; E. Lewis Lilley (Leicester), £1 1*s*.; Sheffield Panel Committee, £25; Shropshire Local Medical and Panel Committee, £10; R. G. McGowan (Manchester), £2 2*s*.; East Sussex Medical Committee, £210. Total £967 8*s*. 6*d*.

Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C.1.

ROYAL SURREY COUNTY HOSPITAL.—At present this hospital is run at a loss of £2500 per annum and two new wards are being added to cope with the long waiting-list. To maintain these and the nurses' home an additional income of about £4000 will have to be obtained. This means that in all an additional yearly income of £6500 or £7000 must be found if the hospital is to be clear of debt.

MEDICAL NEWS

University of Oxford

On Feb. 29th the degree of D.M. was conferred on C. Wilson and of B.M. on J. F. Loutit.

University of London

Mr. Wilfred Trotter, F.R.S., has been appointed to the university chair of surgery at University College Hospital medical school.

Mr. Trotter, who is 63 years of age, was educated at University College where he graduated M.B. with first-class honours and was awarded the gold medal in 1896. He also received a gold medal and the university scholarship in surgery on taking the B.S. degree in 1899, and after obtaining other qualifications was appointed surgical registrar and lecturer in surgery at University College Hospital in 1901. Five years later he joined the honorary staff of the hospital and also of the East London Hospital for Children. A subsequent appointment, for a time, to the West End Hospital for Nervous Diseases showed his bias towards neurological surgery and its underlying physiology, but he has also worked and reported on the surgery of the mouth and pharynx, on goitre, and on other and various subjects. His book on "Instincts of the Herd in Peace and War," which first appeared in 1916, has won him a collateral reputation as a biologist, and his published works include the Hunterian oration of 1932 and many lectures and addresses delivered before colleges and societies. Mr. Trotter is a member of the council of the Royal College of Surgeons of England and served on the Medical Research Council from 1929 to 1933. In 1928 he was appointed honorary surgeon to King George and in 1932 serjeant surgeon. He holds honorary doctorates from the Universities of Edinburgh and Liverpool and was elected F.R.S. in 1931.

The Graham Legacy committee have awarded a gold medal to Sir Thomas Lewis for research in connexion with the treatment of cardiac disease conducted at University College Hospital and medical school.

Prof. William Bulloch, F.R.S., has been appointed Heath Clark lecturer for the year 1936.

The title of Fellow of University College, London, was conferred on Dr. H. P. Himsworth, Mr. R. J. Ludford, D.Sc., Dr. Arthur MacNalty, and Mr. Julian Taylor.

University of Dublin

Mr. J. K. Jamieson, professor of anatomy and dean of the medical school at the University of Leeds, has been appointed to the chair of human anatomy and embryology at Trinity College, where he has for some time been examiner. He succeeds the late Dr. A. F. Dixon.

British Postgraduate Medical School

On March 17th, at 2.30 P.M., Dr. Leonard Colebrook will repeat the lecture on puerperal sepsis which he gave on March 2nd. The lecture is one of a course on recent advances in obstetrics and infant hygiene which is being given at the school, Ducane-road, Hammersmith, London, W.

New Ophthalmic Clinic

The King Edward Memorial Hospital, Ealing, is now providing a clinic in connexion with the Voluntary Hospitals Ophthalmic Clinic Scheme. It is held on Wednesday afternoons, and is open to members of approved societies and to contributors to the Hospital Saving Association. Those with incomes below a certain scale may also attend and are charged a fee of half a guinea and the cost of any spectacles prescribed.

Epsom College

The council of the College will shortly award a St. Anne's scholarship of £60 a year to an orphan girl, not less than nine years of age on July 15th, 1936, who is the daughter of a medical man who was at least five years in independent practice in England or Wales. Application must be made by May 15th on a form to be had from the Secretary of the College, 49, Bedford-square, London, W.C.1.

The council will also shortly award a Grewcock pension of £70 a year to a retired medical man who from old age, permanent incapacity from illness, reduced circumstances, or other cause is in need of it. There is no limitation as to age, but special consideration will be given to the claims of candidates having association with Worcestershire, Lincolnshire, or Carmarthenshire. Forms of application, which must be returned by the middle of May, can be had from the secretary.

Dr. William Warburton Pemberton has been appointed sheriff of Cambridgeshire and Huntingdonshire for the year 1936.

ON Monday, March 9th, the offices of the Radium Commission will be removed from 5, Adelphi-terrace, W.C.2, to 18, Park-crescent, Portland-place, W.1.

Institute of Psycho-Analysis

Dr. Ernest Jones will preside at three lectures on the emotional life of civilised men and women which will be given at the Caxton Hall, S.W., at 8.30 P.M. on Thursdays, March 12th, 19th, and 26th. The subject of the first lecture, by Dr. Sylvia Payne, is Work and its Meaning for Us. Tickets may be had from the secretary of the institute, 36, Gloucester-place, W.

Catholic Medical Congress

The second international congress of Catholic physicians meets in Vienna from May 28th to June 2nd, and the main subject for discussion will be eugenics and sterilisation. Full information may be had from The Oesterreichisches Verkehrsbureau, Friedrichstrasse 7, Vienna.

Nottingham General Hospital

To commemorate his 70th birthday Mr. W. G. Player has given £1000 to this institution.

Legacy for Swansea General Hospital

Mrs. Sarah Powell has left the residue of her estate, which is expected to amount to some £20,000, to this hospital. The money is to be used to build a new ward in memory of her brother, the late Sir Samuel Evans, and herself.

Clacton and District Hospital

The Silver Jubilee extensions to this hospital, which was built in 1899 to commemorate Queen Victoria's Diamond Jubilee, will be ready for opening by Easter. The extensions have cost about £10,000 and more money is needed to equip and furnish them. They include wards for abnormal maternity cases, electrical and massage departments, and an administrative block.

Hunterian Society

The gold medal which this society awards annually for the best essay written by a general practitioner has for the first time been given to a practitioner resident outside Great Britain. The subject set for 1935 was the conduct of midwifery in general practice, and the prize essay was submitted by Dr. Francis Bennett, of Christchurch, New Zealand. The subject chosen for 1936 is rheumatoid arthritis, its diagnosis, treatment, and end-results, and for 1937 the prognosis and care of heart disease in general practice. Further particulars may be had from the hon. secretary of the society, Mr. Arthur Porritt, 27, Harley-street, London, W.

Fellowship of Medicine and Post-Graduate Medical Association

Courses arranged for M.R.C.P. candidates are as follows: chest diseases, Brompton Hospital (March 10th to April 4th); chest and heart diseases at the Royal Chest Hospital (March 15th to April 4th). A demonstration on the fundus oculi will be given at the West End Hospital for Nervous Diseases on Tuesday, March 31st, at 8.30 P.M.; and a course in orthopædics at the Royal National Orthopædic Hospital from March 9th to 21st; and in infant's diseases from March 30th to April 4th. Week-end courses include chest diseases, at the Brompton Hospital (March 7th and 8th); clinical surgery, at the Royal Albert Dock Hospital (March 14th and 15th); general medicine, at the Miller General Hospital (March 21st and 22nd); and urology, at the All Saints' Hospital (March 28th and 29th). Four lectures on diseases of children will be given by Dr. Reginald Lightwood at the National Temperance Hospital on March 25th, 27th, April 1st and 3rd at 8.30 P.M. Lectures are open only to members and associates, and further particulars may be had from the secretary of the fellowship, 1, Wimpole-street, W.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, March 9th.
United Services. 4.30 P.M. Squadron Leader R. H. Stanbridge: Occupational Selection of Aircraft Apprentices.
TUESDAY.
Therapeutics and Pharmacology. 5 P.M. Dr. G. Graham and Dr. S. Levy Simpson: The Treatment of Addison's Disease with Salt. Dr. E. N. Allott: The Effect of Treatment on the Blood Chemical Changes in Addison's Disease. Dr. Audrey Baker and Dr. Margaret Wright: The Vitamin B1 Content of Human Diet.
Psychiatry. 8.30 P.M. Dr. Alfred Meyer: The Selective Regional Vulnerability of the Brain and its Relation to Psychiatric Problems.
WEDNESDAY.
Surgery: Sub-section of Proctology. 5 P.M. Mr. J. P. Lockhart-Mummery: 1. Spindle-celled Sarcoma of Buttock Treated by Radium. No Recurrence two years later. 2. Recurrence after Local Excision of Adenoma of Rectum. Mr. Lionel E. C. Norbury: 3–4. Extensive Papilloma of Rectum Removed by Perineal Excision. 5. Extensive Papilloma of Pelvic Colon Removed by Paul's Operation. Dr. Cuthbert Dukes: 6. Lymphatic Spread of Cancer of the Rectum. 7. Derivation of Fistulæ from Intramuscular Glands. 8. Misplaced Epithelium (possibly Pancreas) within the Rectum. Mr. O. V. Lloyd-Davies: 9. Villous Papilloma of the Rectum.
FRIDAY.
Ophthalmology. 5 P.M. (Moorfields Eye Hospital, City-road, E.C.). Mr. H. B. Stallard: 1. Sarcoma. 2–3. Glioma. 4–6. Coats' White Rings of the Cornea. Mr. F. A. Juler: 7. Congenital Retinal Fold. 8. Angioma of Orbit.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, March 9th.—8.30 P.M., Mr. A. Dickson Wright: Phlebitis and its Treatment.

HARVEIAN SOCIETY OF LONDON.
THURSDAY, March 12th.—8.30 P.M. (Manson House, 26, Portland-place, W.), Dr. H. Letheby Tidy: Treatment of Gastric and Duodenal Ulcer. (Harveian Lecture.)

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, March 13th.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Dr. Harold Crampton: The Unexpected in Anæsthesia.

SOUTH-WEST LONDON MEDICAL SOCIETY.
WEDNESDAY, March 11th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common), Dr. W. E. Lloyd: Clinical Meeting.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, N.
FRIDAY, March 13th.—9 P.M., Dr. J. L. Livingstone: Asthma.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, March 10th.—9 P.M. (Paddington Tuberculosis Clinic, 20, Talbot-road, W.), Dr. H. W. A. Post: X Ray Films.

BIOCHEMICAL SOCIETY.
FRIDAY, March 13th.—2.30 P.M. (University College, Gower-street, W.C.), Short Communications and Demonstrations.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY, March 12.—8.30 P.M. (11, Chandos-street, W.), Sir Walter Langdon-Brown: The Place of Psychology in the Medical Curriculum.

NORTH-WEST LONDON MEDICAL SOCIETY.
TUESDAY, March 10th.—9 P.M. (Regal Rooms, Finchley-road, Golders Green), Dr. John Freeman: Immunology in General Practice.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.
THURSDAY, March 12th.—4 P.M., Sir Edmund Spriggs, Dr. B. S. Nissé, Dr. J. B. Mennell, and Dr. F. Nagelschmidt: Rheumatism.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 10th, and THURSDAY.—5 P.M., Dr. R. A. McCance: Medical Problems in Mineral Metabolism. (Goulstonian Lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields.
FRIDAY, March 13th.—5 P.M., Dr. L. W. Proger: Specimens illustrating Tumours of the Kidney.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, March 11th.—3.30 P.M., Prof. Winifred Cullis: Women in Industry.

ROYAL INSTITUTION, 21, Albemarle-street, W.
TUESDAY, March 10th.—5.15 P.M., Prof. Edward Mellanby, F.R.S.: Drug-like Actions of some Foods.

SIR CHARLES HASTINGS LECTURE.
TUESDAY, March 10th.—8 P.M. (B.M.A. House, Tavistock-square, W.C.), Prof. Winifred Cullis and Dr. R. Cove-Smith: Keeping Fit.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY, March 9th.—3.30 P.M., Prof. F. J. Browne: Toxæmias of Pregnancy.
WEDNESDAY.—3.30 P.M., Mr. Eardley Holland: Hæmorrhage of late Pregnancy (II.).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, March 9th.—10 A.M., Skin clinic. 11 A.M., Surgical wards. 2 P.M., Gynæcological and surgical wards, gynæcological and eye clinics. 4.15 P.M., Mr. Green-Armytage: Fevers of Pregnancy.
TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic. 4.15 P.M., Mr. Simpson-Smith: Minor Surgical Problems.
WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic, gynæcological operations.
THURSDAY.—10 A.M., Neurological and gynæcological clinics. Noon, Fracture clinic. 2 P.M., Eye and genito-urinary clinics. 4 P.M., Venereal diseases.
FRIDAY.—10 A.M., Medical wards and skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.
SATURDAY.—10 A.M., Children's and surgical clinics, Medical wards.
Daily, 2 P.M., Operations, Medical and Surgical Clinics.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 9th, to SUNDAY, March 15th.—INFANTS HOSPITAL, Vincent-square, S.W. Mon., Wed., and Fri., 8 P.M., Primary F.R.C.S. course in anatomy and physiology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. M.R.C.P. Clinical and pathological course. Tues. and Thurs. at 8 P.M. Tues., 8.30 P.M., Mr. T. Holmes Sellors: Thorax. Thurs., 8.30 P.M., Mr. R. Coyte: Large Intestine and Rectum. M.R.C.P. Clinical and pathological course at 8 P.M.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. All-day course in orthopædics.—BROMPTON HOSPITAL, S.W. Mon., Tues., Thurs., and Fri., 5 P.M., M.R.C.P. class.—ROYAL ALBERT DOCK HOSPITAL, S.E. Sat. and Sun., course in clinical surgery.—Courses are open only to members of the Fellowship.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, S.W.
WEDNESDAY, March 11th.—4 P.M., Mr. Leonard Phillips: Puerperal Sepsis.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, March 10th.—5.30 P.M., Dr. B. T. Parsons-Smith: Cardiac Breathlessness.

HAMPSTEAD AND NORTH WEST LONDON GENERAL HOSPITAL, N.W.
WEDNESDAY, March 11th.—4 P.M., Dr. H. M. Oddy: Some Aspects of Arterial Disease.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, March 11th.—2 P.M., Dr. Alan Moncrieff: Epituberculosis and Hilum Tuberculosis. 3 P.M., Dr. D. N. Nabarro: Human and Bovine Tubercle.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 9th.—3.30 P.M., Dr. Symonds: Head Injuries (I.).
TUESDAY.—3.30 P.M., Mr. Julian Taylor: Spinal Compression.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Riddoch: Cerebral Tumours.
FRIDAY.—3.30 P.M., Dr. Purdon Martin: Demyelinating and Toxic Diseases of Nervous System.
Out-patient clinics daily at 2 P.M.

LEEDS GENERAL INFIRMARY.
TUESDAY, March 10th.—3.30 P.M., Dr. Towers: Faintness and Vertigo: Demonstration of Cardiac Cases.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 10th.—4.15 P.M., Dr. J. Wharton: Iritis and Glaucoma.
FRIDAY.—4.15 P.M., Dr. Crighton Bramwell: Demonstration of Cardiac Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, March 12th.—4.15 P.M., Dr. E. D. Gray: A Study of Chest Radiograms.

UNIVERSITY OF DURHAM.
SUNDAY, March 15th.—10.30 A.M. (Newcastle General Hospital), Mr. G. F. Duggan: Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, March 11th.—4.15 P.M. (Royal Maternity and Women's Hospital), Dr. R. A. Lennie: Antenatal Care.

WEST CORNWALL MINERS' AND WOMEN'S HOSPITAL, REDRUTH.—New quarters for nurses were opened at this hospital on Feb. 18th. There are five bedrooms, which are centrally heated and have hot and cold water. The cost of the extension has been about £1000.

NOTES, COMMENTS, AND ABSTRACTS

POISONS FOR RODENTS

A TECHNICAL discussion on poisons for rodents was held at the College of the Pharmaceutical Society on Feb. 27th, under the auspices of the University of London Animal Welfare Society. Prof. J. H. Burn presided. It was made clear that the society did not propose to advocate any particular policy or to conduct propaganda at this meeting, but merely to survey the available information. The object of the discussion was to explore the feasibility of selecting and devising poisons for rats and other rodents which should cause as little suffering as possible. Mr. J. G. Wright, lecturer in surgery and materia medica at the Royal Veterinary College, summarised the pathological effects of hydrocyanic acid gas, and bait poisons including arsenic trioxide or potassium arsenite, phosphorus, strychnine, salts of thallium, barium carbonate, and red squill. All except the last two of these figure in Part I. of the list of poisons drawn up by the Poisons Board, and barium carbonate is in Part II. of the list, so that only red squill would be available for unrestricted distribution to the public. All the prohibited poisons produced severe and prolonged suffering. Red squill, when freshly and correctly prepared, was perhaps the least inhumane of the poisons that could be effectively used. It was specific for rats, more toxic for females than for males, and had little effect on domestic animals or man. The toxic principle contained in red squill was different from and additional to the glucosides which gave the drug therapeutic value. The essential action was upon the central nervous system. Symptoms were delayed for several hours after ingestion and began as a paralysis of the hind limbs, which progressively became more generalised, and were accompanied by convulsions of varying intensity, during which the animal might throw itself about. Death occurred in from one to three days from asphyxia following paralysis of the respiratory centre. Mr. Wright suggested as a useful line of research the search for a narcotic that could be combined with red squill, in order to provide unconsciousness during the onset of painful symptoms. Hydrocyanic acid, used for fumigating rabbits and rats in burrows, was the most rapidly acting poison known.

Mr. J. D. Hamer, consultant chemist to the Orient Line, put the poison question in due perspective by describing first the urgent reasons for combating the rat menace and secondly the normal methods employed for this purpose. The most important of these were rat-proofing of premises, elimination of nesting sites and supplies of food and water, and fumigation with hydrogen cyanide (which in view of its toxicity required skilled handling except in the open air). Traps and poison baits were relatively inefficient; if any were to be used he preferred red squill. Bacterial poisons he rejects as unsafe. Mr. T. Howard described the technique of the methods of baiting requisite to outwit the extremely high intelligence of the rat. He favoured a quick-acting poison of high toxicity, but such poisons could not be sold to the general public and were available only to the professional rat-catcher.

In the course of the general discussion which followed, a suggestion was made that research should be undertaken with the object of identifying the rat-toxic principle of red squill and of synthesising a kindred compound which by acting more rapidly would cause a more humane death.

THE COMMON COLD AGAIN

ANOTHER symposium on this vexed and vexing problem appears in the *Health Examiner* (published by the New York Academy of Medicine) for January, 1936. The authors are Dr. Russell L. Cecil, Dr. Yale Kneeland, Jun., and Dr. Walter L. Niles, all of New York. Dr. Cecil's foreword does not carry us far. Having stated confidently that exposure to cold is the surest way to catch a cold, he devotes the rest of his article to a discussion of the treatment of pneumonia. Dr. Kneeland's contribution is more to the point. He holds the rational and modern view that the causa causans of the common cold is a filtrable virus which is, or may be, subsequently aided and abetted by the common pathogenic organisms present in the respiratory passages. In support of this view he quotes the work of T. H. Paul and H. L. Freese on the inhabitants of Spitzbergen who, during the seven months of the year in which they are ice-bound and so isolated from the rest of humanity, do not suffer from colds. In Dr. Kneeland's opinion, the solution of the problem lies in effectively immunising the human race against the virus. Dr. Niles suggests that the way to avoid colds would be to live in regions where they are infrequent; but would not the result of following such advice be to introduce colds into those happy regions? He holds that the public are still insufficiently alive to the seriousness of the cold as a communicable disease which, he thinks, should be handled in a manner similar to measles or scarlet fever. With regard to treatment he has nothing very new to offer. Many will agree with him when he says that there is a tendency to over-treat infected mucous membranes with ephedrine or cocaine. He is inclined to look with favour on the treatment of the cold by morphia or other alkaloids of opium as advocated by Diehl and certain French physicians.

DEFENCE AGAINST AIR RAIDS

THE air raid precautions department of the Home Office has issued a circular to local authorities on "Anti-gas Training," and a leaflet on "Rescue Parties and the Clearance of Débris." These are obtainable from H.M. Stationery Office at 1*d.* and 2*d.* respectively. The circular states that a civilian anti-gas school will shortly be established at Eastwood Park, Falfield, Gloucestershire, and that local authorities and other responsible bodies will be expected to arrange for instruction to be given in their areas by persons who have obtained certificates after undergoing a general course of at least a fortnight at this school. Specialist one-week courses will also be given to doctors and nurses and to suitably qualified chemists. The first five courses at the school will be devoted to police and fire brigade instructors, but vacancies can be provisionally allotted for the whole of the first year. The memorandum on rescue parties forms part of a considerable series of official pamphlets and handbooks now in course of publication.

We have also received a copy of a monthly review described in a covering letter as the only journal in Bulgaria devoted to chemical warfare and the treatment of poison gas casualties. Its title, in French, is *Défense de Gaz. et l'Aéronautique*, and it is published from Boulevard Ferdinand 90, Sofia.

MINISTERING ANGELS ON HORSEBACK

THE condition of rural midwifery in the United States still leaves much to be desired. A recent report[1] on Brunswick County, Va., expresses the opinion that many of the rural midwives there are physically and mentally unfit to practise. No such criticism, however, is true of Kentucky where Mrs. Mary Breckinridge founded the Frontier Nursing Service in 1925. This service now covers an area of more than 700 square miles. There are nine nursing centres and some thirty nurses who, owing to the nature of the country, have to travel about

[1] U.S. Public Health Reports, Dec. 27th, 1935. The Rural Midwife: Her Social and Economic Background and Her Practices as Observed in Brunswick County, Va. By Josephine L. Daniel, Research Worker in Child Hygiene and Public Health Nursing; and William M. Gafafer, Senior Statistician, United States Public Health Service.